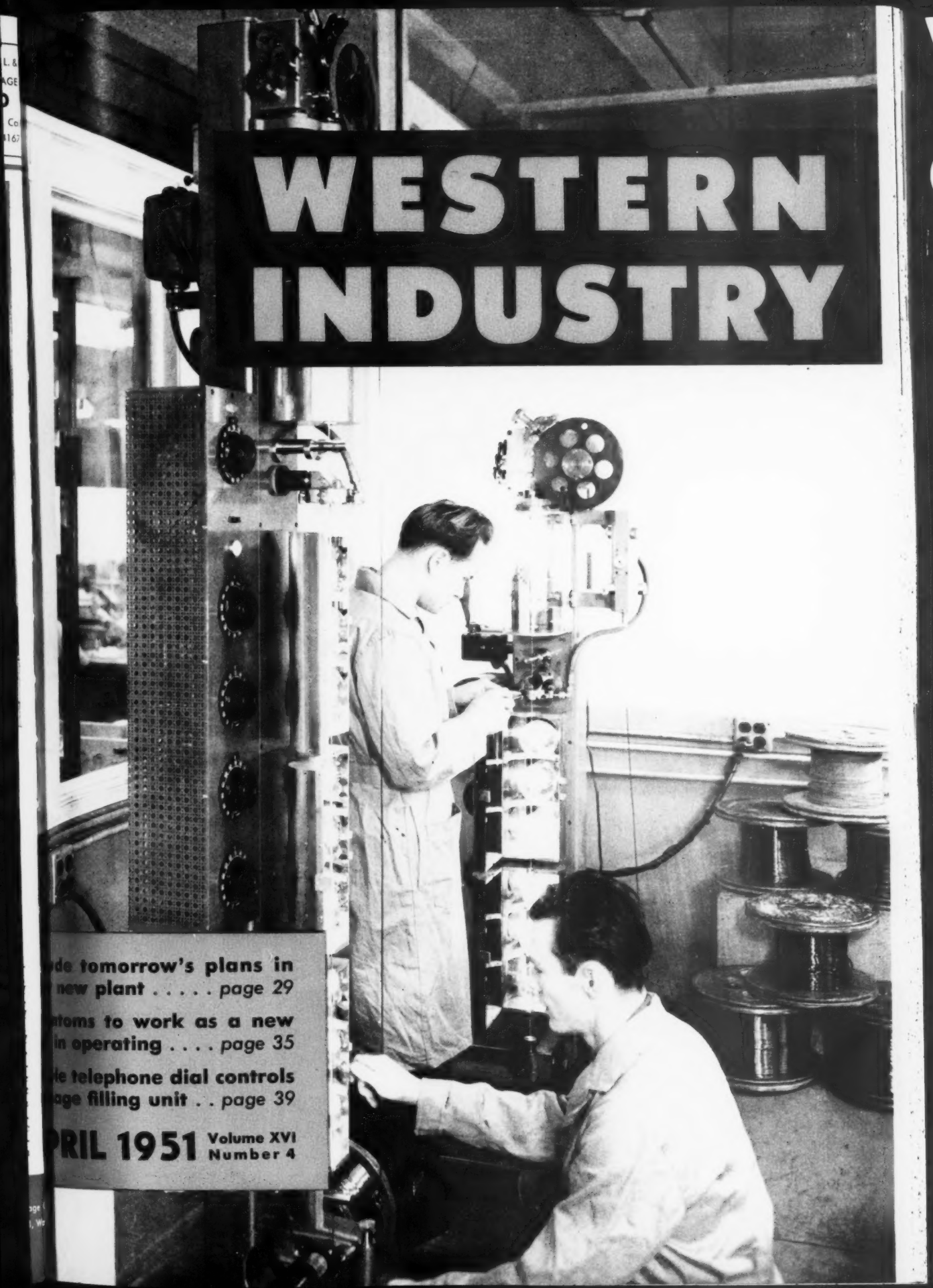
WESTERN INDUSTRY



...de tomorrow's plans in ... new plant . . . . . page 29

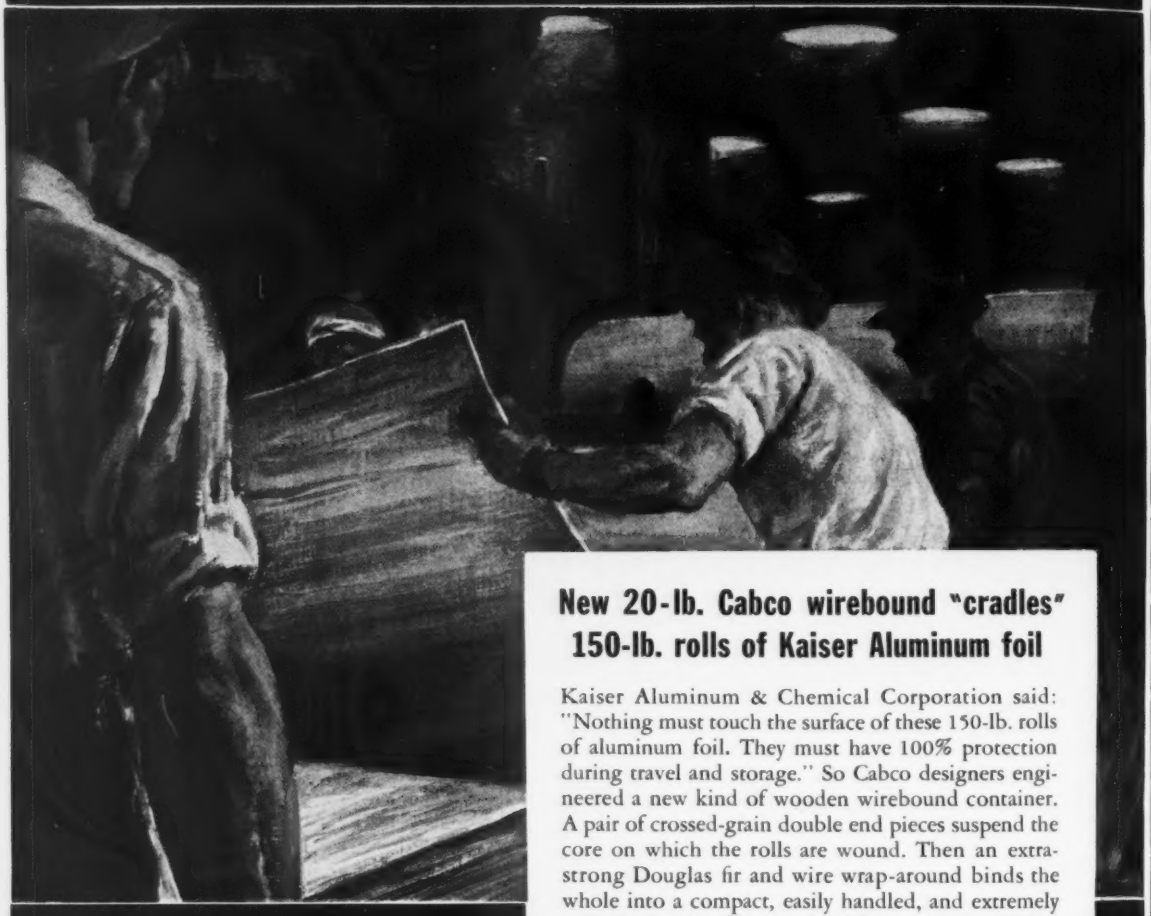
...toms to work as a new ... in operating . . . . page 35

...le telephone dial controls ...age filling unit . . page 39

...PRIL 1951 Volume XVI Number 4

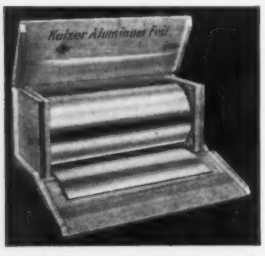
There's more to a Wirebound box than wood, wire and price!

Experience, adequate plant facilities and container know-how are essential to soundly engineered, dependable containers. Cabco has been making wooden containers since 1883. Facilities embrace everything from logging to the finished wirebound. Cabco is the West's recognized leader in designing, developing and supplying wooden shipping containers.



New 20-lb. Cabco wirebound "cradles" 150-lb. rolls of Kaiser Aluminum foil

Kaiser Aluminum & Chemical Corporation said: "Nothing must touch the surface of these 150-lb. rolls of aluminum foil. They must have 100% protection during travel and storage." So Cabco designers engineered a new kind of wooden wirebound container. A pair of crossed-grain double end pieces suspend the core on which the rolls are wound. Then an extra-strong Douglas fir and wire wrap-around binds the whole into a compact, easily handled, and extremely rugged container. Kaiser officials say the new Cabco wirebounds occupy less storage space, assemble more quickly, and weigh 40% less than comparable nailed boxes. Container durability is such that the Cabco wirebounds are regularly returned to Kaiser for re-use.



This is but one of the many new industrial applications for Cabco wirebounds. Perhaps Cabco containers can increase the economy and convenience of your shipping operation.

3171

CABCO
CONTAINERS

A product of the California Barrel Company, Ltd.

Sold only through

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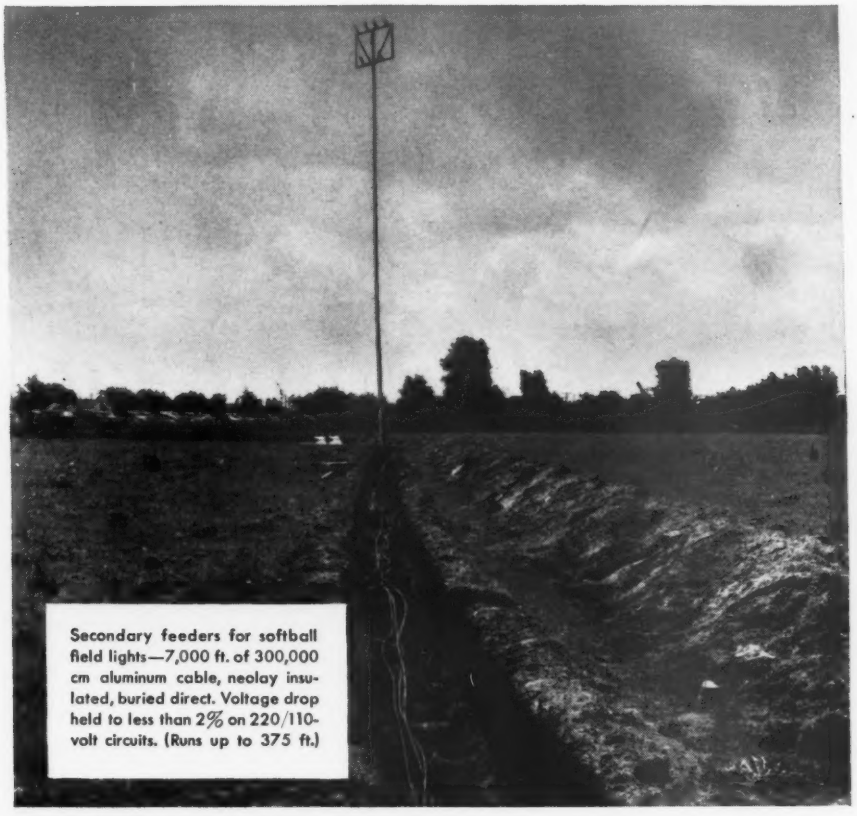
Shooting for low-cost installation?



Secondary feeders for softball field lights—7,000 ft. of 300,000 cm aluminum cable, neolay insulated, buried direct. Voltage drop held to less than 2% on 220/110-volt circuits. (Runs up to 375 ft.)

figure it in aluminum

You can't miss seeing the saving when you figure wiring in aluminum. For distribution lines, power and feeder cable, for industrial wiring—insulated aluminum electrical conductors cost less to buy, less to install. The bigger the cable, the greater your saving. For names of manufacturers, call your nearby Alcoa sales office (look under "aluminum" in your classified telephone directory). ALUMINUM COMPANY OF AMERICA, 1774D Gulf Bldg., Pittsburgh 19, Pennsylvania.

• • •

Although the rearmament program prevents unrestricted sale of aluminum, we are ready to help you with the planning required for electrical wiring projects. Get the facts! Write for "Questions & Answers About Aluminum Conductors and Installations".

Insulated **Aluminum Conductors**

ALCOA ALUMINUM ®

of ALCOA EC ALUMINUM are made by leading manufacturers

You are either OVER paid ...or UNDER paid at $100 a WEEK!

IF you are earning about $5,000 a year, you have reached the most *critical* stage of your business career.

Few men are paid that amount unless they are *potentially worth $10,000.*

It means someone above you thinks you are capable of making at least twice your present salary. But *you* have to prove it!

Five thousand dollars is not a terminal — a man goes on or back. Clerks can be hired for less; executives can demand more.

If you have the resolve and the ambition to pass the $5,000 barrier, the Alexander Hamilton Institute can help you. If you do not have those qualities, nobody can help you.

HOW TO BRIDGE THE GAP

Here, briefly, is the Institute's function: It stimulates your desire to forge ahead, awakens hidden abilities, supplies the training and knowledge every executive must have. It shows you, by practical examples, the methods and procedures followed by management. It enables you to *bridge the gap between your present job and the one above.*

Don't misunderstand. The Institute works no miracles, opens no magic portals to quick and easy success; it will *not* double your income within a few months. Nor will it make corporation presidents of men who are clerks at heart.

But to the man who seeks a sound and realistic program to speed up his progress in business, the Institute's Modern Business Course and Service is ideal. Ideal because it fits the new concept of management, prepares men to handle the *larger* opportunities of business.

Suppose the management of your company met to select a new vice-president, Factory Manager, Sales Manager or Personnel Director. Suppose *you* were a possible choice for one of those positions.

Are you qualified to step into such a job? Is your knowledge broad enough to meet the requirements of an executive position—or do you know little of business outside of your own department?

Will you be qualified two years from today?

Only men who understand the fundamental principles of all departments of business can safely be trusted with important administrative responsibilities.

The Institute offers you a practical, concentrated means of obtaining that knowledge in your spare time.

SEND FOR FREE BOOKLET

So far as it has been possible to do so, the Institute's executive training plan has been outlined and described in an interesting booklet titled "Forging Ahead in Business."

There is no charge for this little book because it is worth only what *you* make it worth. Some men glance through it and toss it aside; others have found a fortune in its pages. It is a serious book about a serious subject; as such, it holds nothing for the merely curious.

But it contains a message of lasting significance to men who are concerned about where they are going in business, and how they are going to get there. To men of this type, copies of "Forging Ahead in Business" are available without cost or obligation. Simply fill in and return the coupon below.

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WESTERN INDUSTRY

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Front Cover

History is being made almost too rapidly for recording in the expanding electronics field in the West. This scene at Helipot Corporation, South Pasadena, California, shows continuous high-speed winding machines for producing various resistance elements of the straight mandril type.

Looking for a competitive sales feature?

CALL YOUR INDUSTRIAL FINISHES SPECIALIST!

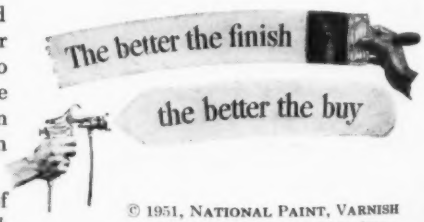
For a competitive sales feature that's hard to beat, give the customer one he can see! Your Industrial Finishes Specialist can help you give product appearance a needed sales stimulus, and cut production costs at the same time.

"Hammered" finishes have unusual consumer appeal, compared to ordinary monotone metal finishes, and are adaptable to a wide range of products. But the old two-spray method made costs prohibitive for many. Industrial Finishes Laboratories have developed new finishes that can be applied in one operation, cutting finishing costs substantially!

This is just one product success story from the files of the Industrial Finishes Specialist! Just one example from hundreds for each manufacturing industry!

Whatever your product . . . whatever your finishing problem . . . and especially if you are engaged in vital defense work, as so many manufacturers are today . . . you'll find it pays to consult an Industrial Finishes Specialist. He's the technically trained, production and sales-minded representative of your Industrial Finishes supplier. To speed up production time, reduce costs, and increase sales, call him in at the design and production planning stage.

Remember, more and more of your customers *start buying with the finish in mind!*



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Twin giants of the West

THE critical need for more steel must be met largely through the production of *new* metal—metal produced from iron ore smelted in a blast furnace.

The limited supply of scrap makes this need for *new* metal more urgent than ever before.

Operating the only two blast furnaces on the West Coast, Kaiser Steel is constantly increasing the nation's supply of new metal. At the rate of 2,400 tons a day—876,000 tons a year—these twin giants produce pig iron that's vitally needed in our preparedness program and for essential civilian products.

More evidence that the West Coast's only integrated *independent* steel plant is helping to build a stronger West . . . and a stronger nation!

It's good business to do business with

Kaiser Steel

built to serve the West

PROMPT, DEPENDABLE DELIVERY AT COMPETITIVE PRICES • plates • continuous weld pipe • electric weld pipe • hot rolled strip • hot rolled sheet • alloy bars carbon bars • structural shapes • cold rolled strip • cold rolled sheet • special bar sections • semi-finished steels • pig iron • coke oven by-products
For details and specifications, write: **KAISER STEEL CORPORATION, LOS ANGELES, OAKLAND, SEATTLE, PORTLAND, HOUSTON, TULSA, NEW YORK**

PUTTING *Air* TO WORK

28 LUNGS THAT EXHALE AN EXPLOSIVE HAZARD

Every 60 seconds there must be a complete change of air in this building. Reason: to prevent the accumulation of explosive hydrogen, used in manufacturing ammonia. But what could be a dangerous process is made safe in one of the newest synthetic ammonia plants recently built in the Southwest by exhausting air through Sturtevant Elbow Axial Flow fans . . . 28 strong, right down the rooftop.

Strong north winds can't "back pedal" those fans . . . and rain is completely shut out. Motors, bearings and belts are located outside the air stream, an industry-proven advantage in exhausting corrosive fumes.

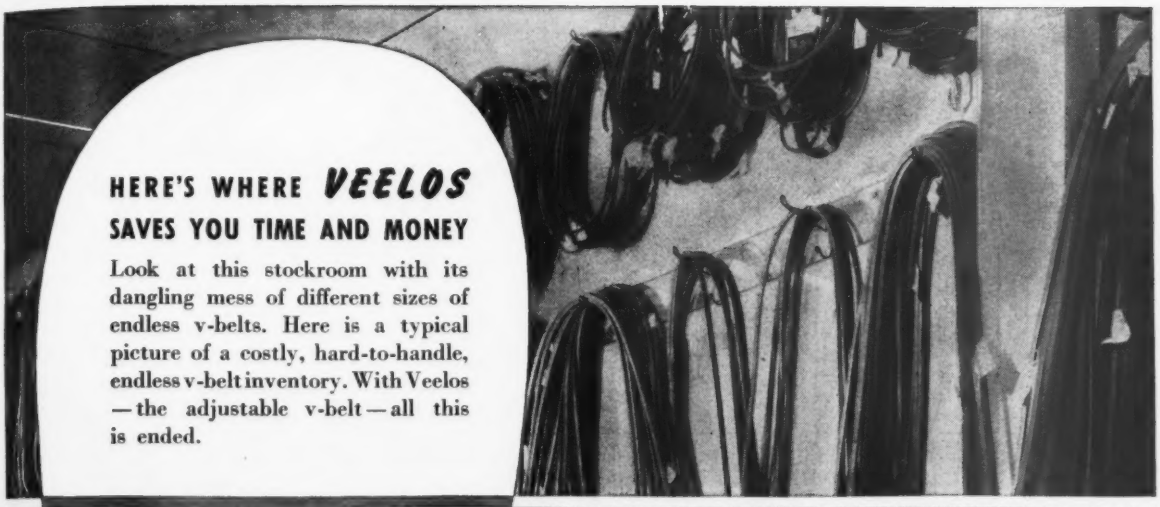
To meet the need for efficient fume or vapor removal in your plant—as well as air conditioning, air handling or air cleaning—there is Sturtevant equipment specifically designed to help you put air to work. Contact your local Sturtevant office, or write to Westinghouse Electric Corporation, Sturtevant Division, Hyde Park, Boston 36, Mass.

YOU CAN BE SURE... IF IT'S **Westinghouse**

J-80209

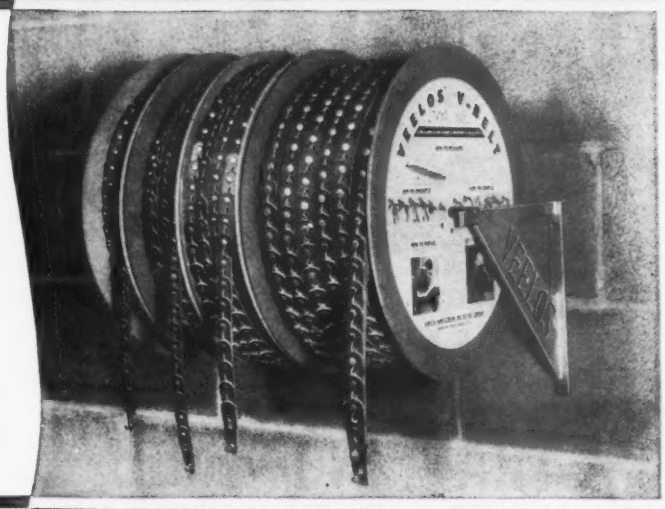
PUTTING *Air* TO WORK

INDUSTRIAL FANS · AIR CONDITIONING · ELECTRONIC AIR CLEANERS · AIR HANDLING APPARATUS · HEATING AND VENTILATING



HERE'S WHERE *VEELOS* SAVES YOU TIME AND MONEY

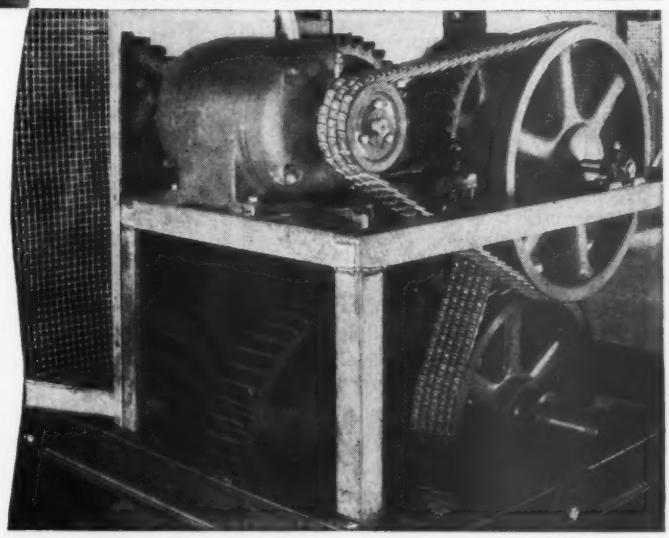
Look at this stockroom with its dangling mess of different sizes of endless v-belts. Here is a typical picture of a costly, hard-to-handle, endless v-belt inventory. With Veelos — the adjustable v-belt — all this is ended.



WITH *VEELOS*, ANY BELT SIZE IS ALWAYS ON HAND

These four reels of Veelos alone can *replace* up to 316 sizes of endless v-belts in the O, A, B and C widths. No more stockroom troubles, no more replacement headaches because Veelos is *always* ready—in the widths you require.

If you are interested in reducing your v-belt costs and increasing your production efficiency, you should have a Veelos Data Book. For free copy of this illustrated book complete with engineering information write*



VEELOS ASSURES MAXIMUM MACHINE PRODUCTION

Veelos is easy to install *without* dismantling outboard bearings. Veelos runs true for vibrationless, full power delivery. Because Veelos is adjustable, uniform belt tension is easily maintained.

VEELOS
THE LINK
V-BELT

ADJUSTABLE TO ANY LENGTH • ADAPTABLE TO ANY DRIVE

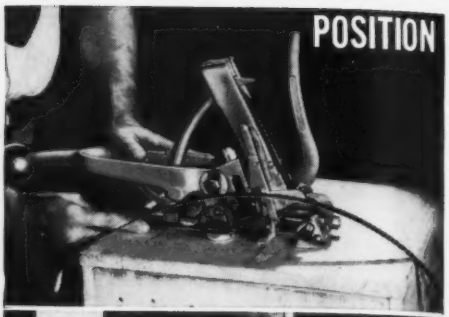
Made in all widths in three types: regular, oil-proof, static conducting. Also double V in A and B. Packaged on reels in 100-foot lengths. Sales engineers in principal cities; over 350 distributors throughout the country. Veelos is known as VEELINK outside the United States.

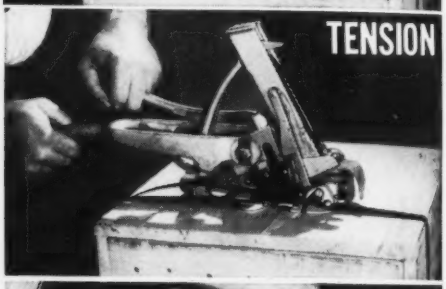
***MANHEIM MANUFACTURING & BELTING COMPANY, MANHEIM, PA.**

4 STEPS 5 SECONDS

with the Improved

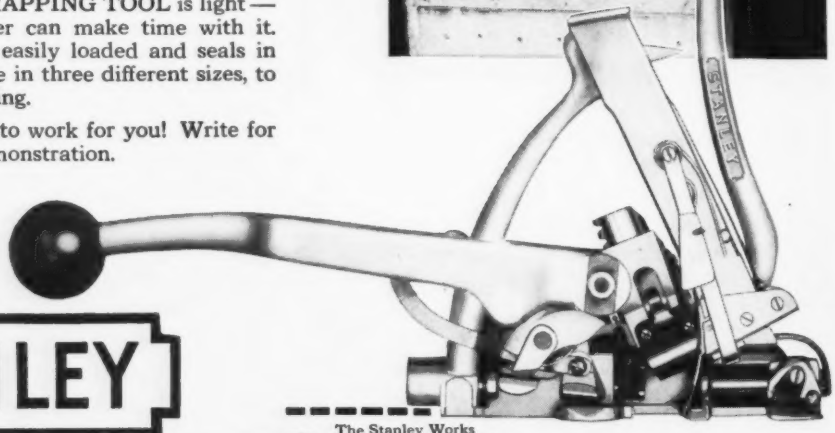
STANLEY ACE STRAPPING TOOL





Here's how to put strapping on a production basis. This improved STANLEY ACE STRAPPING TOOL is light — fast — simple — even a beginner can make time with it. Magazine holds 100 seals — is easily loaded and seals in any position. The "Ace" is made in three different sizes, to handle 3/8", 1/2" and 5/8" strapping.

Decide now to put the "Ace" to work for you! Write for full information or ask for demonstration.



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Threading • Angle Cutting • And Many Others

From the furniture industry to many widely different fields, scores of manufacturers are planning for the future—improving their products for the time when production for civilian use will again be first and foremost.

In planning improvements and shaping your company's future products, you will profit by using OSTUCO Steel Tubing. More and more, product designers and engineers are proving that *costs can be cut, beauty enhanced, and strength increased with less weight and bulk.*

Due to the ever-increasing demands of our armed forces, we cannot promise early delivery on new civilian orders. Meanwhile, however, our experience-wise engineers are at your service to provide helpful information and advice . . . to make your future plans take shape with OSTUCO Steel Tubing.

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OF A GIRAFFE

THE **ENDURANCE**
OF A CAMEL

THE **STRENGTH**
OF AN ELEPHANT

HYSTER KARRY KRANE

- Pneumatic tires—works anywhere indoors or outdoors.
- Adjustable boom—5 positions.
- Trunnion steering, maximum maneuverability.
- Speeds up to 10 mph in either direction.
- 10,000 lbs. hoisting and transporting capacity.

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Typical users include—Automobile factories—Contracting and general construction firms—Heavy machinery distributors—Factories—Food manufacturers—Foundries—Mining—Motor freight lines—Public utilities—Railroads—Warehouse and storage firms—and many other industries where the lifting and transporting of heavy loads is of prime importance.

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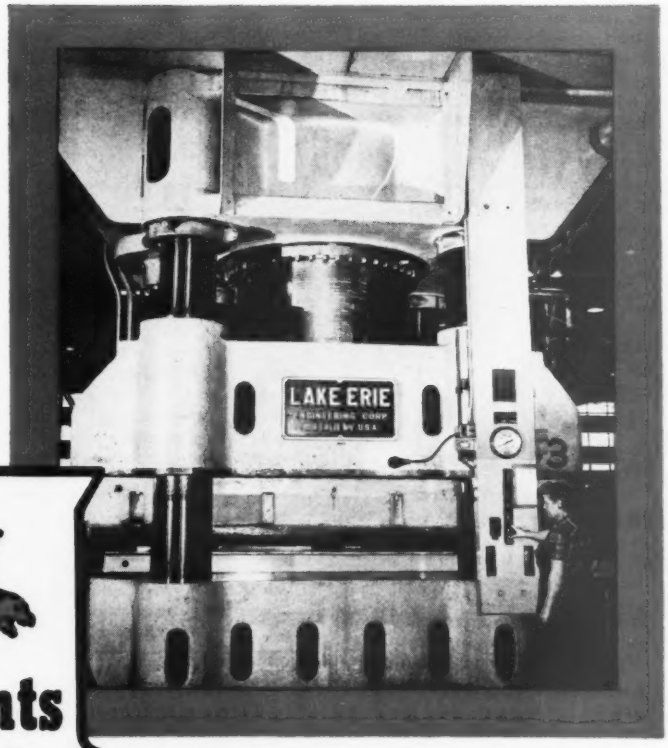
High Performance!

The high performance of Boeing's radical B-47 Stratojet is no more important than the performance and efficiency of the machinery that helped build it. For ten years this Giant Lake Erie press and hundreds of other machines at Boeing have performed production miracles . . . relying on the world's greatest family of lubricants — Gargoyle.

GENERAL PETROLEUM CORPORATION



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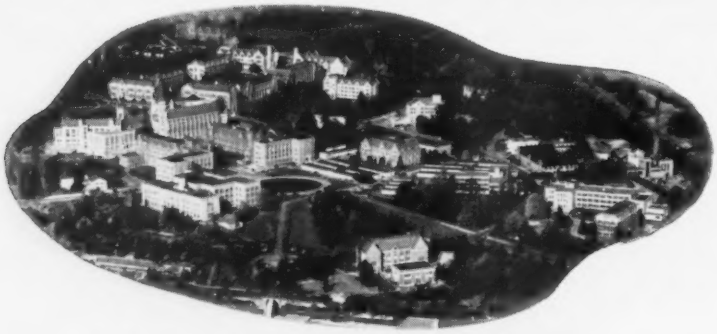
Lubricants

American Blower . . . a time-honored name in air handling



In Seattle, a leading university, as well as commerce, industry and public utilities, have made use of American Blower's Branch Office by calling Seneca 5860. To contact the American Blower Branch Office in your city, consult your phone book.

PLEASANT IDEA . . .

In Seattle, as in your home town, apartment house owners realize that invigorating, fresh air indoors can do much to attract desirable tenants. American Blower Utility Sets do just this. The Utility Set is ideal for general ventilation where duct systems are required. It can be used as a supply or exhaust fan and is equipped with Aileron Control for regulation of air flow. They're available as standard packaged units ready for immediate installation. Is there an idea here for you?

PROFITABLE IDEA . . .

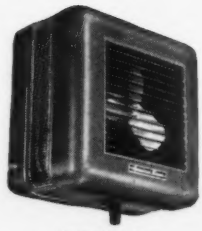
Fuel savings alone often will pay for a new heating system when you replace obsolete equipment with American Blower Unit Heaters. For example, a manufacturer of specialty equipment investigated and found he could convert his whole plant to unit heaters and pay for the system in 3 years with the fuel savings alone. American Blower carries a complete line of Unit Heaters, including gas-fired models and models for steam or hot water heating systems, wall- or ceiling-mounted.

FRESH IDEA . . .

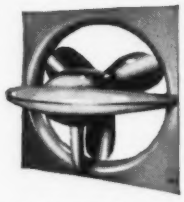
We know an advertising agency in one of our larger cities that recently moved their offices into one of those beautiful old homes along the river. The ventilating system was adequate for a family, but converting it for commercial use posed some problems. But American Blower equipment solved them nicely. For example, smartly-styled Aeropel Fans now keep the conference rooms pleasantly fresh, Utility Blowers ventilate rest rooms, and Ventura Fans handle the large work areas. End result, they say—fresh air fosters fresh ideas.

MAY WE SERVE YOU?

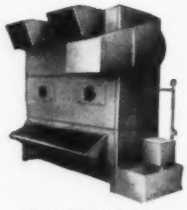
With our new plant in San Leandro, Cal., we can save you time, money and provide you with faster service on most American Blower products. For data call or write our nearest branch office.



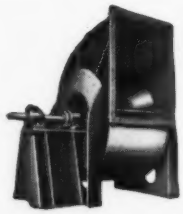
Unit Heaters



Ventura Fans



Air Conditioning Equipment



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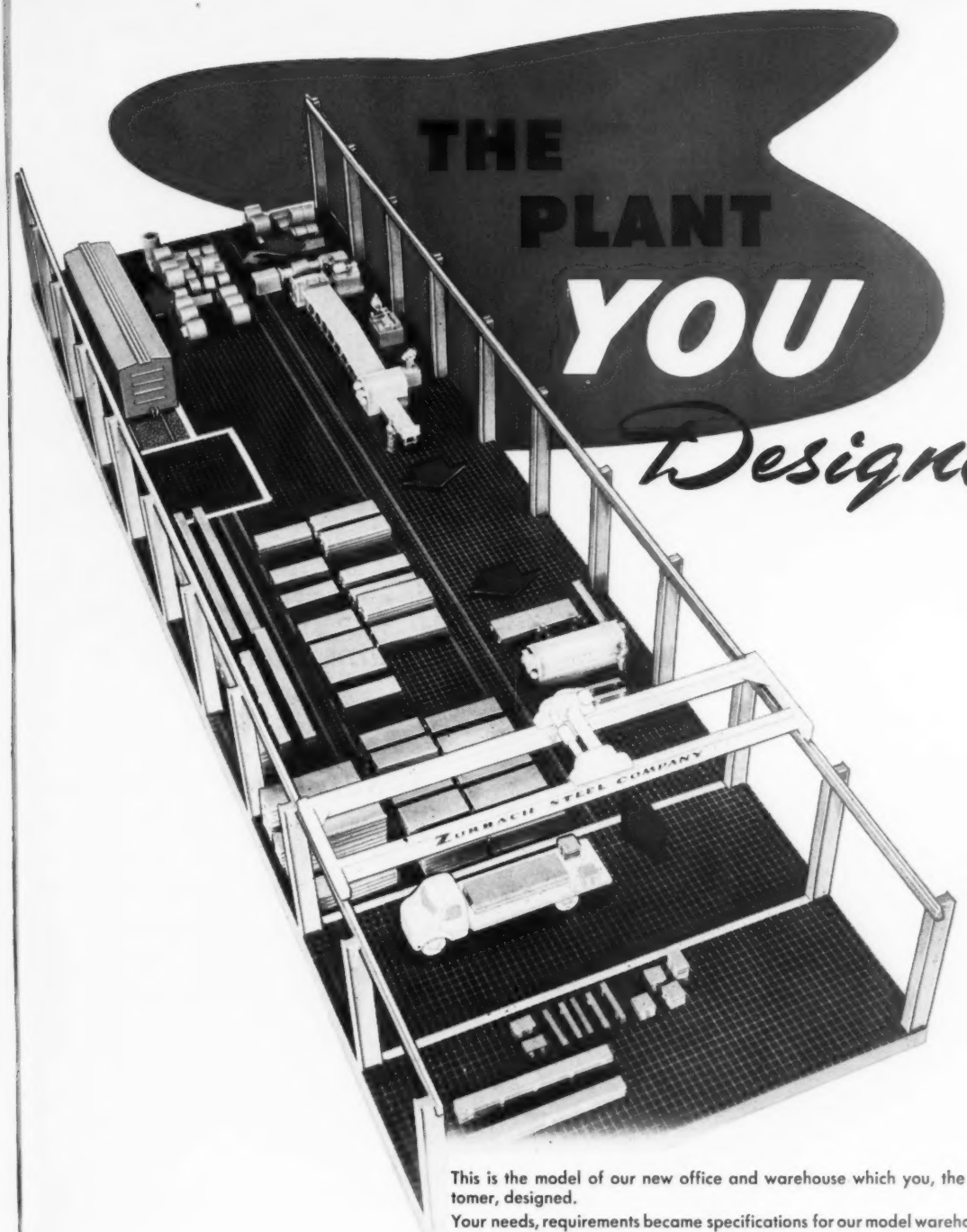
Utility Sets

AMERICAN BLOWER CORPORATION, DETROIT 32, MICHIGAN
WEST COAST PLANT: SAN LEANDRO, CALIFORNIA

Division of AMERICAN RADIATOR & Standard Sanitary CORPORATION

YOUR BEST BUY AMERICAN BLOWER AIR HANDLING EQUIPMENT

Serving home and industry: AMERICAN-STANDARD • AMERICAN BLOWER • CHURCH SEATS • DETROIT LUBRICATOR • KEWANEE BOILERS • ROSS HEATER • TONAWANDA IRON



This is the model of our new office and warehouse which you, the customer, designed.

Your needs, requirements became specifications for our model warehouse.

The location was selected on the basis of easy access to your plant via freeways and major through-highways with additional consideration to rail and truck service from our suppliers.

Equipment was procured and located in terms of your particular production needs.

Yes—you gave us the design—May we show you what steel SERVICE means today.

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No. 1615 Diaphragm Valve
Iron Body, Neoprene lined

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Separate disc and diaphragm design distinguishes these Crane Valves from all similar packless types. Life of diaphragm is multiplied because it's used only to seal the bonnet—not for seating. The separate disc seats the valve, eliminating wear and tear on the diaphragm.

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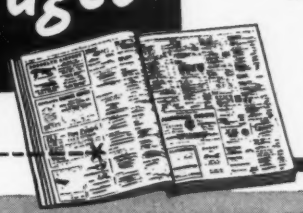
You'll Find Your Alcoa Distributor In Your Yellow Pages



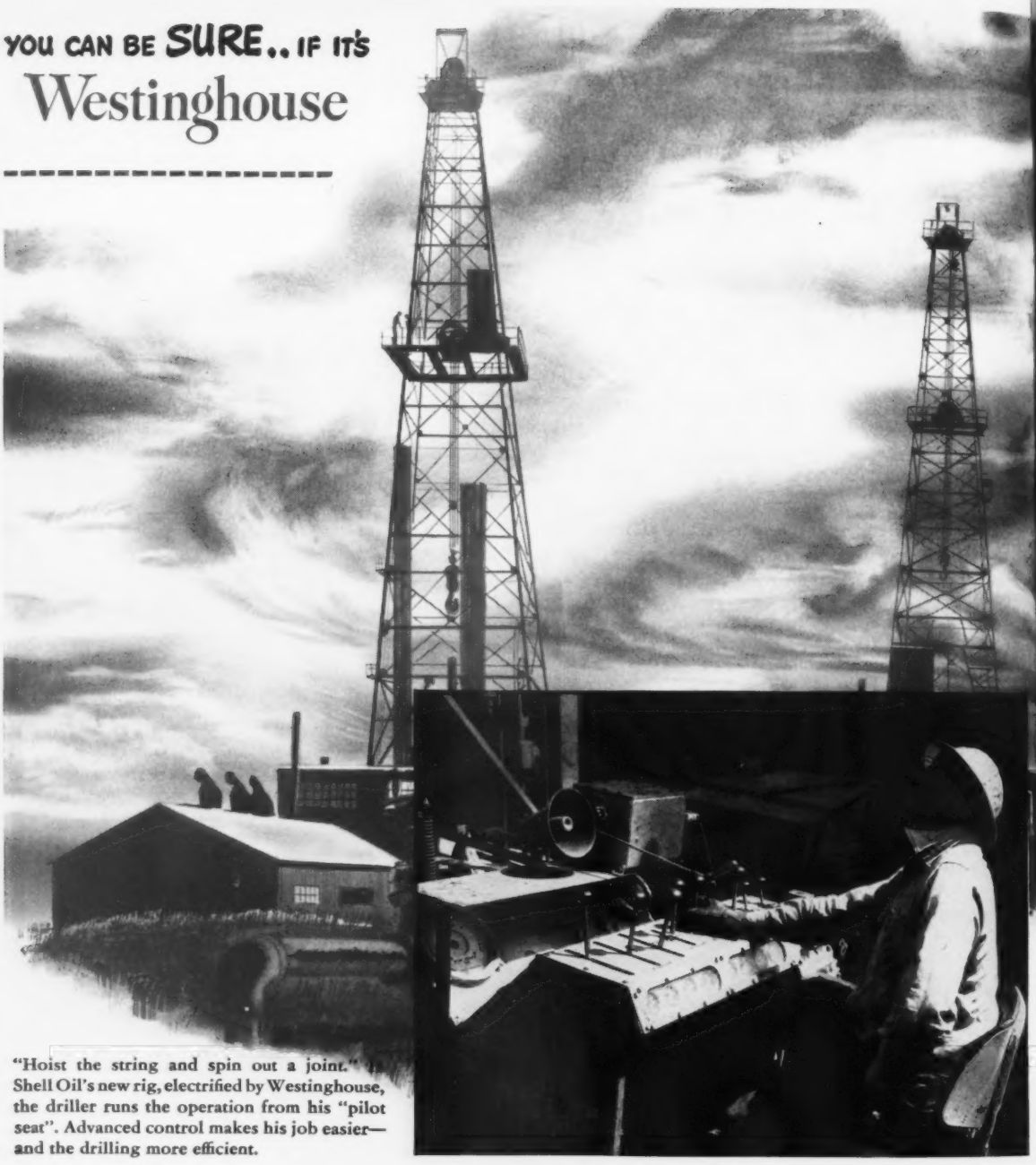
LOOK UNDER "ALUMINUM"

ALCOA ®

YOUR ALCOA ALUMINUM DISTRIBUTOR HAS THE TECHNICAL HELPS YOU NEED

YOU CAN BE **SURE**.. IF IT'S

Westinghouse

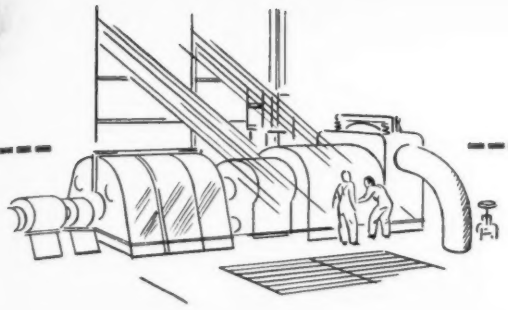


"Hoist the string and spin out a joint." In Shell Oil's new rig, electrified by Westinghouse, the driller runs the operation from his "pilot seat". Advanced control makes his job easier—and the drilling more efficient.

WESTERN OIL—MORE PRODUCTION, MORE KW's

Important factor in the expanding Western economy: the oil industry. In ten years, refinery capacity has climbed over 35%, now tops 1.2-million barrels per *day*. And these refineries buy almost one billion kilowatthours per year!

Oil fields use still more because electrification makes big savings. Take Shell Oil's new electric drilling rig, engineered by Westinghouse. Drilling a well is a complex operation, and the electrical system in this rig functions with amazing flexibility to spin the drill string, pump cooling and cleansing mud to the drill bit, hoist the string to change the bit. Every maneuver in a complex chain of operations is carefully controlled and co-ordinated. Net result: higher efficiency, man-hour savings, better drilling control. And the Westinghouse know-how that designed this ultramodern installation can help solve *your* electrical problems.



Why did Western power output nearly TRIPLE in ten years?

When the figures were in for 1950, the statisticians announced: generators in the West had whirled out more than 64-billion kilowatthours. *That's almost three times the 1940 output—a growth rate 32% over the U. S. average!*

Why the zooming output in the West? The chief reason: industrial growth. Industry uses two-thirds of Western power. And in the last decade 10,000 new plants have been built in the West and most of the original 20,000 have expanded. That's what's taking the extra kilowatts!

Many people have played a part in the big Western surge, and we're pleased to be among them. Much of the apparatus that generates this new power was engineered by Westinghouse. And Westinghouse developments that USE power to best advantage help boost the over-all consumption. Shell Oil's new drilling rig, described on the opposite page, is a good example. Moreover, the eight Westinghouse plants producing this equipment *in* the West, *for* the West, are themselves a significant part of Western industrial growth.

As a factor in Western development, Westinghouse has a basic stake in its future. And that makes your Westinghouse office a good place to go when you want help in using power. J-92004

Westinghouse

A MAJOR FORCE IN WESTERN GROWTH

WESTINGHOUSE

PLANTS AT BERKELEY, DENVER, EMERYVILLE, LOS ANGELES, PORTLAND, SALT LAKE CITY, SEATTLE, SUNNYVALE

OCS*

Killer of Many Belts before their time

*Overcured Sections — present every 30′ to 40′ in all belts made by the flat press method. Only Rotocuring eliminates this major cause of belt failure.

...but you won't find this common cause of failure in BWH ROTOCURED BELTS!

In the flat press method of curing, a segment of the belt is double cured every 30 to 40 feet. These overcured segments of 2″ to 4″ in width across the entire belt can't be avoided in flat press curing because the previously cured sections are advanced each time less than a full press length. Result: a number of structurally weak, failure-inviting segments (the exact number depending on the length of the belt).

With BWH ROTOCURED belts there are no overcured segments because the vulcanization is *continuous*. You as a belt user benefit *4 ways:*

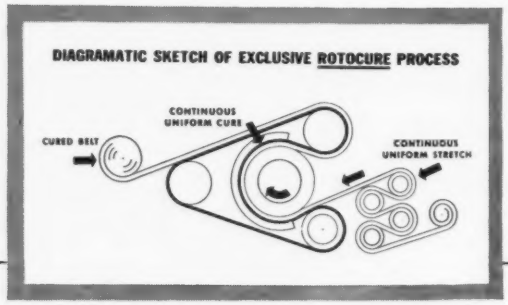
1 You get uniform, abrasion-resistant covers *overall.*

2 You get improvement of flex life up to 40%.

3 You get no mechanical distortion (inherent with flat press curing at the press ends).

4 You get constant uniform stretch *always.*

These product advantages are why BWH ROTOCURED conveyor belts last longer, require less maintenance and lower the cost per ton of material conveyed. You get them too in BWH transmission belts, plus a higher coefficient of friction (no dusting agents required with Rotocure—hence tensions are minimized and belts last longer). Call in your BWH distributor or write us direct for complete details.



BWH DEPENDABLE RUGGEDNESS

Another Quality Product of

BOSTON WOVEN HOSE & RUBBER COMPANY

Distributors in all Principal Cities

PLANT: CAMBRIDGE, MASS. • P.O. BOX 1071, BOSTON 3, MASS., U.S.A.

What makes an industry progressive?

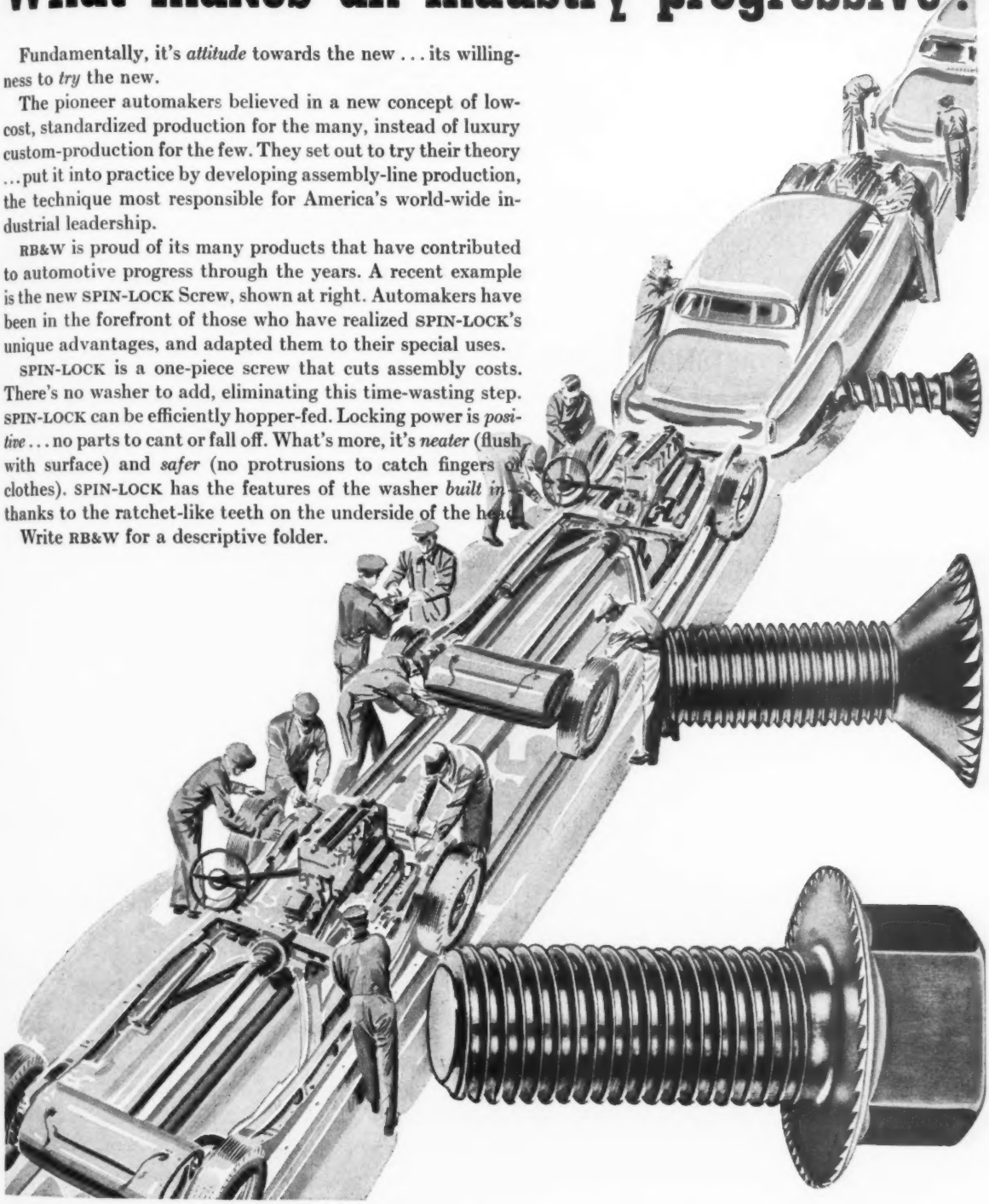
Fundamentally, it's *attitude* towards the new . . . its willingness to *try* the new.

The pioneer automakers believed in a new concept of low-cost, standardized production for the many, instead of luxury custom-production for the few. They set out to try their theory . . . put it into practice by developing assembly-line production, the technique most responsible for America's world-wide industrial leadership.

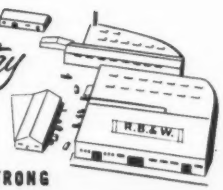
RB&W is proud of its many products that have contributed to automotive progress through the years. A recent example is the new SPIN-LOCK Screw, shown at right. Automakers have been in the forefront of those who have realized SPIN-LOCK's unique advantages, and adapted them to their special uses.

SPIN-LOCK is a one-piece screw that cuts assembly costs. There's no washer to add, eliminating this time-wasting step. SPIN-LOCK can be efficiently hopper-fed. Locking power is *positive* . . . no parts to cant or fall off. What's more, it's *neater* (flush with surface) and *safer* (no protrusions to catch fingers or clothes). SPIN-LOCK has the features of the washer *built in*, thanks to the ratchet-like teeth on the underside of the head.

Write RB&W for a descriptive folder.



RB&W *serves Western industry with the complete quality line*



WEST COAST PLANT: 4466 Worth St., Los Angeles, Calif. Other plants at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill. Additional sales offices at: Oakland, Dallas, Chicago, Chattanooga, Detroit, Philadelphia. Sales agents at: Portland, Seattle. Distributors from coast to coast.

106 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

EXCLUSIVE

FLUID DRIVE
reduces
clutch wear

HYPOID GEARING
30% greater strength

CHRYSLER ENGINE
65HP industrial engine
with floating power

AUTOMOTIVE TYPE SAFETY BRAKES
smooth brake action

SHOCKLESS STEERING
passenger car
steering ease

ROLLER CARRIER UPRIGHTS
low friction—long life

Only YALE combines all these modern engineering achievements in one superior gas truck!

NOW READY FOR YOU... developed to peak efficiency after 2 years of intensive on-the-job testing

JUST LOOK at the engineering and technical improvements built into this new YALE Fork Lift Gas Truck!

Here are exclusive features that will bring more time-saving, man-saving, money-saving advantages to your materials handling than was ever before possible!

In every vital part of this truck you get the finest new developments in automotive engineering—every part built for years of hard service—every part tested and re-tested under rugged on-the-job conditions.

That's why today you get smooth, powerful gas truck operation day-in day-out. On steep ramps, rough roadways, in any weather—this YALE Gas Truck *delivers*, moves, lifts and stacks the goods. Let us show you exactly *how* YALE can accomplish all of this in your plant. Write for the facts today.

Capacities up to 10,000 pounds

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Roosevelt Boulevard & Haldeman Avenue, Phila. 15, Pa.

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_____Please have your local representative call on me.
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Philadelphia 15, Pa.

IN OUR MAILBOX

Applications of Isotopes

Editor, *Western Industry:*

Mr. Offner's article should arouse a good deal of interest within professional circles, digesting, as it does, the many possible applications of isotopes to specific engineering problems: This is a growing field and your article will, I believe, direct this technique to the attention of many who will find it of value.

I should like to show this to other AEC installations—would it be possible to send me a few additional tearsheets?

A. R. Lee, Chief, Public
and Technical Information
Idaho Operations Office
U. S. Atomic Energy
Commission

(Referring to "Geiger Counters for Wear Testing," page 42 of March 1951 issue.)

* * *

Review & Forecast Appreciated

Editor, *Western Industry:*

We are yearly subscribers to your magazine. We compliment you on the very informative Jan. 1951 issue. Kindly send us three additional copies of this issue.

Alan R. Stearns
The Stearns Company
Glendale, Calif.

* * *

Editor, *Western Industry:*

Several weeks ago I heard a review of the January issue of your magazine over the radio commentary by Chet Huntley, on Radio Station KNX. This analysis of the progress of the State of California and prediction of the future greatly interested me, and I would like to obtain a copy of this issue.

William Bailey Palmer
Pasadena, California.

* * *

Needs Planer Bolts, Hardness 35

Editor, *Western Industry:*

Noting on page 50 of your February, 1951 issue, "Tool and Die Steel Qualifications," can you advise where we can obtain Planer Bolts with a Rockwell hardness of around 35 and a PSI tensile strength of 125,000 or better?

R. J. Lloyd
Mutual Fir Column Co.
Tacoma, Washington.

* * *

We Must Have Forests

Editor, *Western Industry:*

As the organization which originated the tree farm program in the United States and which sponsors it yet in the Douglas fir region of Washington and Oregon, we are most gratified by the prominence you gave Billy Welsh's "Tree Farming . . . woodlots for the long future" in your article on the forest industries in your Review and Forecast Number.

You have learned so well what so many trade journal editors and newspaper pub-

Continued on page 24

EDITORIAL COMMENT

All Lean On Each Other

A BIG BUSINESS is an institution that would be sunk without a host of small businesses from which it buys goods and services.

For example, V. A. Bellman, a General Petroleum vice-president, told a Portland commercial club recently that its geologists had to depend on map-makers, consulting paleontologists, land brokers and geophysicists, its production department on 228 small businessmen in the San Joaquin Valley alone, plus 750 land royalty owners, 175 small crude producing outfits, and its manufacturing department 52 small businessmen who sell only skill, to say nothing of others who provide equipment and supplies.

And these little businesses themselves grow. A new independent petroleum marketing organization started in Oregon in 1946, and in less than four years accounted for 3.2% of the total gasoline sales in Oregon.

To put it another way, Charles E. Walls, in charge of Ford Motor Company's West Coast parts procurement program, recently was quoted as saying "There is one point which is not always understood—big business does not stand alone—it takes a lot of small and medium firms to make a big company big. We need 6,000 partners."

Or, to quote Donald W. Douglas, Jr., contract requirements and testing director for Douglas Aircraft Company, "By and large, we have come to regard most of the regular suppliers as part of the company, and I overheard one of our purchasing agents tell a salesman the other day that in about a month the salesman ought to be eligible for a Douglas 25-year service pin."

As Conventions Might Be

THE OTHER DAY we inadvertently dropped in on a convention of an organization that we had never had contact with before, but what a shock!

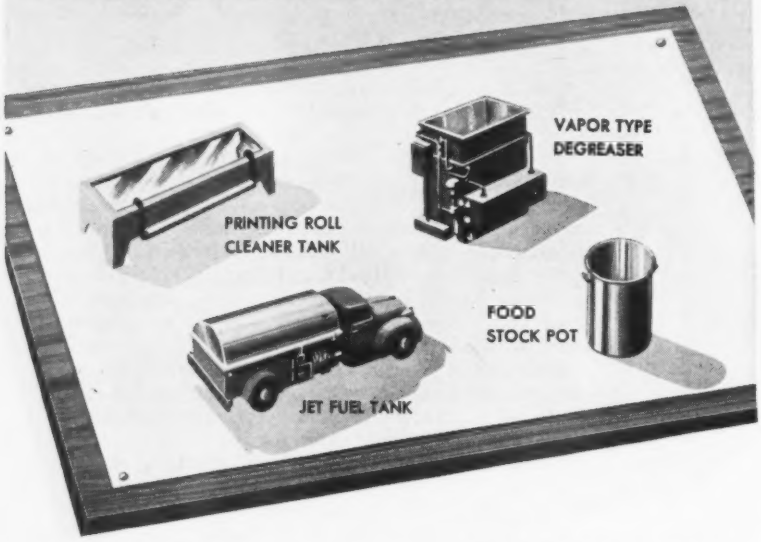
Before anyone realized it, the first speaker was deep in some entirely new stuff that had everyone frantically reaching for his pencil to take notes as fast as possible. Every word right to the point, and the instant he finished a dozen people were on their feet firing questions at him.

"A beautiful start," we thought, but the next speaker was every bit as good, and so it went on all day. Not a dull spot in the entire meeting, not a second wasted on trivialities, ancient history or grammar school stuff that everyone learned years ago. As we pinched ourselves to see if it was really true, we saw the program chairman approaching.

"Worked like a charm," he said, "although there were some hurt feelings that had to be soothed. We told everyone it had to be just like a radio program, set a 60-day deadline before the convention for papers to be in and announced that the committee would review all papers, edit out the deadwood and send them back to be rewritten several times if necessary. Next year we may give the same topic to three different people, pick the best one and then get that one sharpened up. That really would be something."

If we hadn't sat through the entire program and also talked to the chairman, we wouldn't have believed it could be true. But just then we heard a bell tinkling, first faintly, then loudly. It was our alarm clock! Oh well, it was a wonderful dream, anyhow.

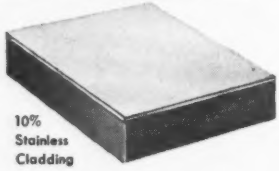
SHORT CUT TO PRODUCT IMPROVEMENT AT LOW COST



Design Them Around PERMACLAD *Stainless Clad Steel*

Corrosion Resistant! Easily Formed!

Manufacturers and designers are discovering the advantages of designing products and equipment around PERMACLAD Stainless Clad Steel. PERMACLAD combines the surface characteristics of stainless steel with the formability of mild carbon steel and provides corrosion resistance at low cost. PERMACLAD is stainless steel (usually 10% or 20% but can be varied to meet design requirements) inseparably welded to mild carbon steel. If your product or equipment requires corrosion resistance on one side only, you can effect savings in the consumption of critically short materials through the use of PERMACLAD.



PERMACLAD is a material that has proved itself in hundreds of applications. More and more applications are being discovered for PERMACLAD everyday. Why not get complete information now and see if your product or equipment can be improved with PERMACLAD. Write for data-filled folder D-74.

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Scrap is a vital necessity to keep America's steel mills operating at capacity. Cooperate! Sell your scrap now

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STAINLESS CLAD STEEL

ALAN WOOD STEEL COMPANY

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125 Years of Iron and Steel Making Experience

Other Products: A. W. ALGRIP Abrasive Floor Plate • A. W. SUPER-DIAMOND Floor Plate • Plates • Sheets • Strip • (Alloy and Special Grades)

IN OUR MAILBOX

. . . Continued from page 23

lishers haven't learned—that if we are to have a forest industry, we must have forests. The tree farm program is designed to supply a continuing amount of raw material for the important wood-using industries throughout the nation.

W. D. HAGENSTEIN
Forest Engineer
Forest Conservation Committee of Pacific Northwest Forest Industries
Portland, Oregon.

* * *

Up-to-date Monthly Textbook

Editor, *Western Industry:*

I am presently conducting courses in Principles of Marketing and Advertising in the College of Business Administration at the University of Washington. I was familiar with *Western Industry* magazine while attending the Stanford Graduate School of Business last year. I am wondering if it would be possible for you to add my name to your circulation list as I am sure that a great deal of the material in your magazine would be of value in connection with my class work here.

RICHARD R. STILL
Instructor in Marketing
University of Washington.

* * *

Editor, *Western Industry:*

For study in a class in Trade Publications I am getting together a representative selection of leading trade publications in various fields. Will you please send me two recent issues of *Western Industry* for student use?

FREDERIC C. COONRADT
Lecturer in Journalism
University of Southern California
University Park, Los Angeles.

* * *

Water Information Pertinent

Editor, *Western Industry:*

Mr. Hawksley's article on California waters was very interesting and informative. We note that a series of such articles are contemplated. If these articles cover the waters of other West Coast states in the same manner as the California waters, we would be very much interested in securing several copies of each article.

D. M. WOOD, Chief Chemist,
Pennsylvania Salt Manufacturing Company of Washington
Tacoma, Washington.

* * *

Editor, *Western Industry:*

In your December, 1950, issue you ran the second of two articles on "The Industrial Quality of Pacific Coast Waters." Somehow or another we missed the first article, and particularly the tabulation of water analysis. Since this is pertinent information to us in connection with the use of our Ruud Monel Water Heaters, which we build for the West Coast here in Santa Cruz, we would appreciate it if you could send us a copy of the first article which we presume was in the November issue.

ARCHIE M. SCHWIESO
Plant Manager
Fanger Research and Manufacturing Co.
Santa Cruz, California.

To cut your maintenance cost on heavy duty engines...

SHELL ROTELLA OIL

NOW IMPROVED

NEW SHELL
ROTELLA OIL
LEAVES THE "SPECIFICATIONS"
'WAY
BEHIND!

STEPPED UP CLEANING ACTION

The ability to *suspend* contaminants has been deliberately stepped up in *New* Shell Rotella Oil. So has its *detergent* action. Engines stay remarkably *clean*.

EVEN GREATER ANTI-WEAR PROTECTION

New Shell Rotella Oil directly counteracts the acid action of fuel combustion products in the vital top-cylinder zone . . . with correspondingly great reduction in wear.

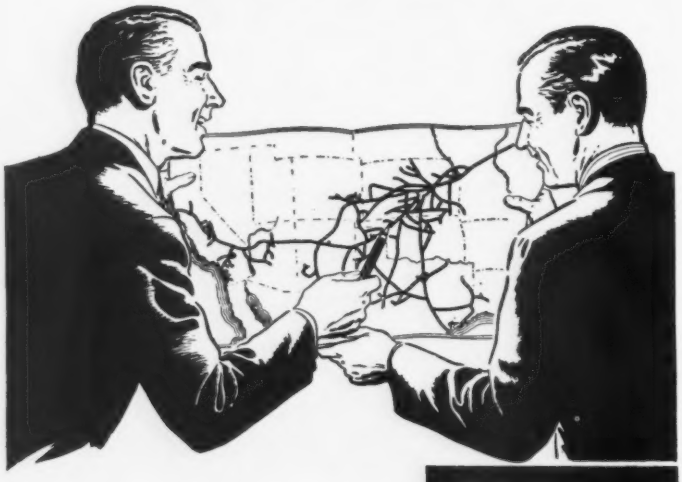
• "Exceeds every accepted performance standard for oils in its class," the report says. It excels particularly in *piston cleanliness* and in *freedom from ring-groove deposits*. To you, this oil's big edge in its class means a tremendous increase in engine life... a drastic cut in maintenance costs. Yes, a real dollars-and-cents saving. Get the full story on *New* Shell Rotella Oil from your Shell representative.

NEW SHELL ROTELLA OIL

SHELL

For all heavy duty engines

Your
answer man
with the Santa Fe



Where's my car? What about special handling? How about rates?

Bring on your freight questions, open up your freight problems. Your Santa Fe freight representative has the answers or knows where to get them quickly.

He is either in your town or has your town assigned to him. His knowledge of freight problems in your territory, plus the "know how" of Santa Fe's entire organization of transportation specialists, is at your service, just by a telephone call.

Let him tell you why and how *it pays to ship Santa Fe all the way!*

F. H. Rockwell
General Freight Traffic Manager
Chicago 4, Illinois

it pays to ship

Santa Fe

all the way

CALENDAR OF MEETINGS

Apr. 16-18—Pacific Northwest Bakers Association, at Multnomah Hotel, Portland. Contact M. J. Holbrook, 623 S.W. Oak St., (BR 0553), Portland.

April 20-21—Pacific Northwest Purchasing Agents Conference, at Multnomah Hotel, Portland. Contact Don Woodman, Purchasing Agents Assn. of Oregon, P. O. Box 1269, Portland, WE 6796.

Apr. 23-24—Pacific Northwest Trade Assn., at Multnomah Hotel, Portland. Contact Arthur J. Farmer, Chamber of Commerce (AT 9411), Portland.

Apr. 27—Industrial Minerals Congress, at Portland. Contact R. S. Mason, Woodlark Bldg. (BR 2276) Portland.

Apr. 27-28—Symposium, sponsored jointly by local sections of Institute of Radio Engineers and American Institute of Electrical Engineers, with U. C. and West Coast Electronic Manufacturers Assn. collaborating, on influence of environment on electronic components and their applications; at University of California at Los Angeles. Contact Dr. James A. Marsh, North American Aurophysics Laboratory, Downey, Calif.

May 7-9—Northwest Electric Light & Power Assn., Business Development Section, at Multnomah Hotel, Portland. Contact Berkeley Snow, Corbett Bldg. (AT 7871), Portland.

May 8-11—Insulation Board Institute, at San Francisco. Contact B. J. Blackburn, Mgr., 111 West Washington St., Chicago 2, Illinois.

May 14-19—American Trucking Assn. at San Francisco. Contact Kenneth Beadle, c/o Pac. Inter-Mt. Express Co., Oakland, Calif.

May 16-18—Northwest Electric Light & Power, at Davenport Hotel, Spokane. Contact Berkeley Snow.

May 24-26—Washington Motor Transportation Assn., at Davenport Hotel, Spokane. Contact Mr. Carleton (MA 7131).

May 31-June 1—Western Forest Products Safety Conference, at Multnomah Hotel, Portland. Contact E. H. Crosby, Columbia River Loggers Assn., Portland. BR 0479.

June 7-9—Rocky Mountain Coal Mining Institute Convention, at Hotel Utah, Salt Lake City. Contact Walter F. Clarke, Gen. Mgr., Independent Coal & Coke Co., Salt Lake City.

June 10-13—Triple Industrial Supply Convention, at San Francisco. Contact Exec. Secy. Natl. Supply & Machinery Distributors Assn., H. R. Rinehart, 505 Arch St., Philadelphia 6, Pa.

June 11-12—Pacific Northwest Section of American Association of

Cereal Chemists, at Davenport Hotel, Spokane. Contact Mr. Montzhermeir (KE 2636).

June 15-30—First Seattle International Japanese Trade Fair, Seattle, Wash. Contact Robert Story, Mgr., World Trade Division, Seattle Chamber of Commerce, Seattle.

June 18, 19, 20—SPI Pacific Coast Chapter Conference, The Society of the Plastics Industry, at Tahoe Tavern, Lake Tahoe, Calif. (Note date change from June 14, 15, 16.) Contact Langdon P. Williams, SPI, Inc., 295 Madison Ave., New York 17, N. Y.

June 19—Institute at Oregon State College, special public session on Northwest Resources Mobilized for National Defense and Security, Oregon State College, Corvallis, Oregon. Contact Dr. J. Granville Jensen, O. S. C., Corvallis.

June 20-22—Heat Transfer and Fluid Mechanics Institute, at Stanford University, Palo Alto, Calif. Contact Director of Information, Stanford.

June 24-28—Pacific Coast Paper Box Manufacturers Assn., 1951 Convention, at Empress Hotel, Victoria, B. C. Contact J. N. Mills, Exec. Sec., 672 So. Lafayette Park Place, Los Angeles (DU 3-0221).

June 24-29—American Pulp & Paper Mill Superintendents Assn. national meeting at Multnomah Hotel, Portland. Contact R. B. Morden, Morden Machines Co., Pacific Bldg., Portland. BE 9354.

July 1-4—American Society of Heating and Ventilating Engineers national meeting, at Multnomah Hotel, Portland. Contact Bert Farnes, Farnes & Martig, 417 N.E. Couch St., Portland. EA 1949.

July 8-13—Natl. Flat Glass Jobbers Assn., Mirror Mfgrs. Assn., at San Francisco. Contact Miss Minita Westcott, Ex. Sec., 2217 Tribune Tower, Chicago 11, Illinois.

Aug. 13-15—Society of Automotive Engineers, West Coast section, at Olympic Hotel, Seattle, Wash.

Aug. 21-23—American Institute of Electrical Engineers, at Multnomah Hotel, Portland. Contact C. L. Brown, Pacific Power & Light Co., (AT 9421, Ext. 328), Portland.

Aug. 22-24—Pacific Electronic Exhibit (sponsored by West Coast Electronic Manufacturers Assn.) and Institute of Radio Engineers, jointly, at San Francisco Civic Auditorium. Contact Heckert Parker, 600 Beach St., San Francisco 9, phone ORdway 3-9379.

Aug. 29-31—Institute of Radio Engrs. and West Coast Electronic Mfg. Assn., at San Francisco. Contact Heckert Parker, Mgr., 1980 Jefferson St., San Francisco.

Sept. 4-7—Pacific Coast Gas Assn., at San Francisco. Contact Clifford Johnstone, Mng. Dir., 447 Sutter St., San Francisco.

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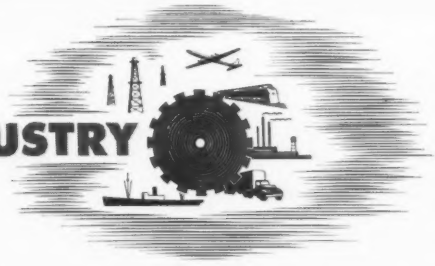
WESTERN INDUSTRY



JUST ABOUT every Western manufacturing and processing firm has the problem of a new plant either ahead of it or right under its nose, because you can't stop the growth of the West; and the extra millions added to Western population require more goods and services. Even yesterday's new factory is beginning to bulge and must be expanded or still another establishment built.

How to build the new plant right is a highly important question. So, to help Western industrialists in finding the right answers, *Western Industry* begins in this issue a series giving our readers the benefit of Western experience and thinking along this line.

Each article will feature a different phase of building construction.

BUILDING for tomorrow . . . TODAY

ANY FIRM in the West facing the question of a new plant naturally wants to be sure that no considerations affecting the efficiency of future operations are overlooked or underestimated.

Many of these lie outside the actual processing or production layout, and are involved in the building structure itself, or in various other architectural, construction and engineering features.

Service to Readers

Consequently *Western Industry* begins with this article a series of new plant descriptions intended to cover as many of these considerations as possible, in order to help our readers save time and money and increase their opportunities for profitable operation. Arrowhead Rubber Company of Downey, California, is the plant chosen to lead off the series.

Necessity of a complete meeting of minds between the company's engineering and production executives and the architect, building contractor and sub-contractors is obvious. Yet in the development of the plans for the new plant, one group may not fully recognize the other's problems, and when the structure is completed, the end product may fall short of what might have been attained.

Typical Problems

Here are typical questions that come up in almost every instance:

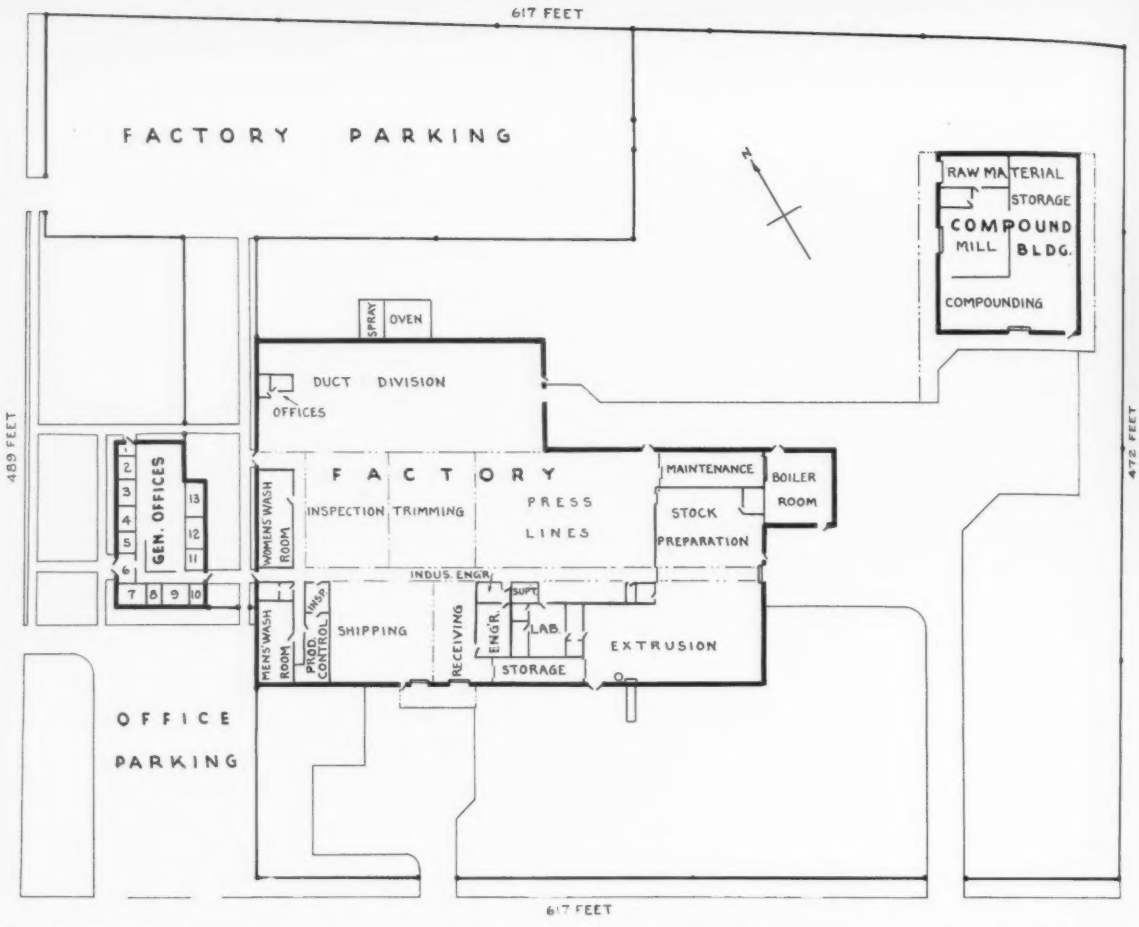
1. *Future expansion.* If the new plant is later enlarged, will it permit the same relative production efficiency as before?
2. *Air conditioning and ventilating.* Is it planned so as to give maximum labor productivity? How does it affect such operations as drying and painting? If postponed, will the eventual cost be prohibitive and the resulting efficiency as great as if installed originally?
3. *Natural and artificial lighting.* Is full advantage taken of every opportunity?
4. *Electric wiring.* Have future loads and outlet points been adequately provided for?
5. *Piping, drainage and steam.* Does the planning take care of everything? Or will costly changes have to be made later?

In the case of Arrowhead Rubber Company the point foremost in the architectural discussions when the plant was in the planning stage, before any drawings were executed, was the necessity for designing it to allow ample expansion. Any enlargement in either factory or office structure, would have to be done without disturbing any functional operations in process at the time.

Arrowhead Rubber Company is a subsidiary of National Motor Bearing Company, with home offices in Redwood City, California. Originally, when the parent firm purchased Arrowhead, it was to assure a constant supply of rubber component parts for oil seals, NMB's basic and staple product.

Arrowhead's Basic Reasons

Fundamentally, three basic reasons were responsible for the decision of Arrowhead Rubber Company to build a new plant. They were:



Ground layout shows how expansion on each side is possible without upsetting the basic set-up for smooth production flow. Location of duct division and boiler room provides for dust control and advantageous use of steam without hampering other plant work.

1. To allow expansion of existing facilities;
2. Lease on the old property had expired;
3. Too much cross-handling and back-handling of materials was involved in the Vernon plant. (It was equivalent to four blocks of travel from the production line to shipping department, a by-product of the plant "just growing.")

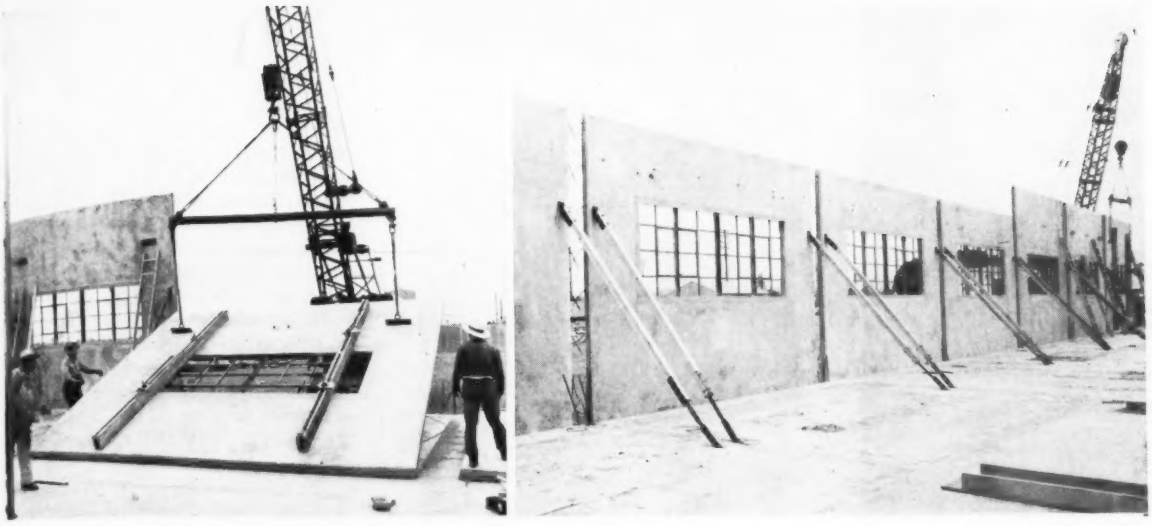
Answers Required

A number of basic architectural considerations were involved in the development of new building plans, and Arrowhead officials conferred with Buttress & McClellan, architects, to determine the solution of these points, among many others:

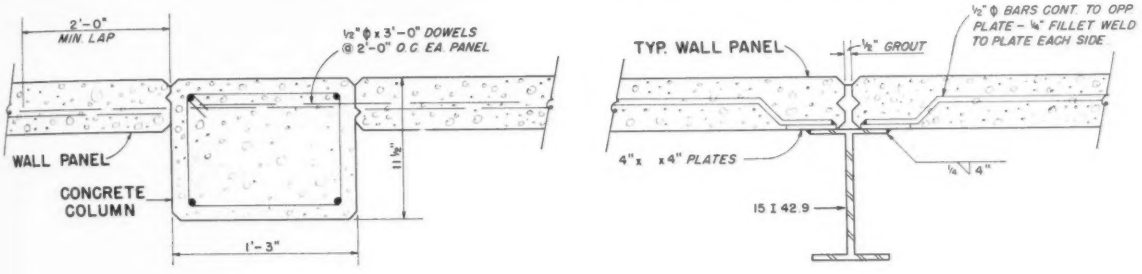
1. Heat, both from Southern California sunshine and from steam-operated presses, demanded a free circulation of air.
2. A separate building should be provided for the mixing mill (known as the "compound"), to keep carbon black and dust away from other manufacturing operations and personnel.
3. Extrusion room and prep room should be efficiently located to assure good production flow; yet those rooms should be also shielded from the rest of the plant as further means of dust control.
4. Toilet locations should be handy to personnel.
5. Research lab and engineering department (production control) should be directly available to plant operations more than to office areas.
6. Boiler room should be located most advantageously, where steam would be available to the compound, to the press lines, and yet where the heat and attendant problems of boiler room operation would not interfere with plant personnel or plant operations.
7. The Airtron Duct Division, where the company's line of rubber and fabric flexible ducting is manufactured, should occupy an entire separate wing of the main factory building. (Duct Department floor space in the new plant is approximately four times that of the previous location in Vernon, and all phases of manufacturing in the de-

Situation Typical of Many Western Plants

Arrowhead Rubber Company's plant was selected to lead off *Western Industry's* new series of articles on plant construction for the following reasons: (1) It is a typical Western plant, that started small, grew larger, and just keeps right on growing; (2) it is located in a typical Western setting (the community is surrounded by orange groves, and practically all the workers come to work in private automobiles); (3) the buildings were all designed with expansion foremost in mind; (4) the type of construction is a typical Western product, both developed here and best suited to this area.



Wall panel being raised into position (left). When upright (right) the panels are joined by concrete or steel I-beam columns. Sketches below show how each type of column is joined up with the wall panel. Concrete column at left, steel column at right.


2'-0" MIN. LAP
½"ϕ x 3'-0" DOWELS @ 2'-0" O.C. EA. PANEL
WALL PANEL
CONCRETE COLUMN
1'-3"
TYP. WALL PANEL
½" GROUT
½" ϕ BARS CONT. TO OPP. PLATE – ¼" FILLET WELD TO PLATE EACH SIDE
4"x x4" PLATES
¼ 4"
15 I 42.9

partment are separate and independent of other production departments.)

A prevailing southwest offshore breeze was in large part responsible for the directional facing of this plant (toward north), since the breeze could be counted upon to help cool the building. Sawtooth building design provides monitors that face toward north, affording also a good north light for daylight working conditions. In that vicinity, a south, east, or west light includes sun and glare, and establishes a more difficult working condition.

As the southwest wind passes across the tops of these monitors, it creates a low-pressure area that evacuates warm air from inside the building. To assist the wind in this effort, and to provide cooling insurance on still-air days, fans are set in the monitors to pump out the warm air.

"Tilt Up" Walls

Plant and office are constructed by a method known as "Panelcrete," developed and patented by J. E. McClellan and J. H. MacDonald, principals in Buttress & McClellan. Common terminology for this type of construction is "tilt-up."

Actual construction steps for outside walls of Arrowhead buildings were:

1. Isolated footings were constructed for use under the columns. Walls are non-bearing. They act as beams to carry their own load to the footings over a span equal to the clear distance between the columns.
2. Since the finished first floor line is at or near grade, the floor was then poured, after such grading as was necessary.
3. Wall panels were then poured in flat position, using the floor slab as the lower form. A patent was recently granted Buttress & McClellan, Inc. (Pat. No. 2,531,576) covering the separating agent technique used between the base slab and the wet concrete.
4. Wall panels were then raised into position. In some cases (front and back walls only of the Arrowhead plant) a concrete column was poured between the ends of adjacent wall panels. Dowels, projecting from the wall panels into the poured columns, constitute the only conection between the wall panels and other members.
5. Where steel columns were used (side walls of the plant), the flanges of the columns were welded at intervals to small steel plates located at the inner face of the wall panels and anchored to them. The joint between the ends of adjacent wall panels is then filled with grout.

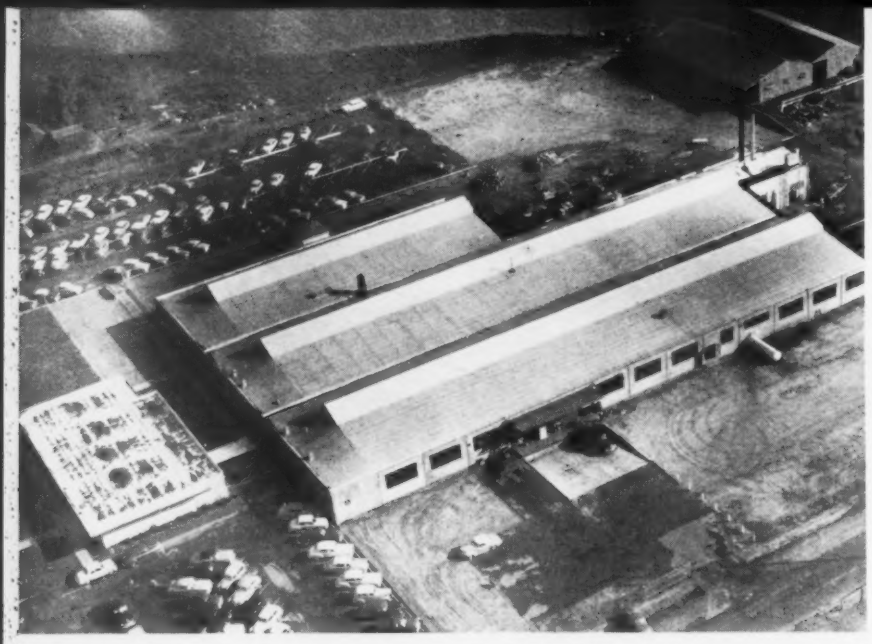
Windows are placed and permanently located while the wall panel is lying horizontally.

Movable Side Walls

Concrete columns were poured between panels on the front and back walls only, of both office and factory buildings. Steel I-beam columns were used between panels on the side walls. This was all a basic part of the architectural plan (see accompanying sketch).

Operations inside the plant structure, and functions inside the office building, are engineered and laid out in such a manner that distances from front to back are static, while expansion can occur laterally without much trouble or bother to the activities in progress.

Hence, with sidewall construction of a "temporary" nature, the welds can be cut (between wall panels and up-



Aerial view further indicates how expansion sideways is a simple matter. At right rear is separate building for the mixing mill, to isolate the carbon black and dust.

right steel columns) by acetylene torch, and the wall panels removed.

For example, the Duct Department is about to be enlarged. All expansion that is necessary can be accomplished with a minimum of fuss and bother, without affecting any operations currently going on.

First, the floor will be poured, after grading. Then two complete walls (one at the southeast end of the Duct Department, the other on the northeast side of the plant and maintenance department) will be removed, merely by cutting the panels loose from the steel columns with an acetylene torch.

Wall panels will then be repositioned on opposite sides of the rectangular floor, and again welded to steel columns properly placed. When done, there will be actually no more wall area present than there now is, but the Duct Department will be considerably expanded.

Interior Arrangements

Extrusion and prep room, housed in an "el" shape, are walled off by plywood to eliminate dust from the rest of the manufacturing process. Doors between the plant and the extrusion and prep rooms are sliding doors, operated by Stanley electric switches (manually) to open, and photo electric cells, also Stanley, (automatically) to close.

When first designed, photo electric cells operated these doors in both directions. However, the cell on the plant side was of necessity too far from the door itself, it was found. It was purposely set a few feet down the aisle from the door, so that a man with a hand truck, or the lift truck in operation, would not be hindered in progress. However, the cell was also so far away from the door that other people, who had no need to enter the el, would open the door automatically when they merely happened to walk down the aisle.

Now, a cord is suspended from a switch on the ceiling. One tug on that cord and the door opens from the plant side. After the cell is interrupted on the el side, the door closes.

Toilet locations were strategically spotted around the plant. Figuring that a man walks 3 ft. per sec., it would take him 1½ minutes to stroll from one end of the long room (270 ft.) to the other. So the washrooms and toilets are spaced and located to save all personnel at least one minute per trip. Over the period of a year, the time saved amounts to some considerable money.

Women's locker room and lavatories are the closest to the main factory entrance. Consequently, the female employees do not have to walk past the men's locker rooms and lavatory sections.

Maintenance department is adjacent to the boiler room, press room, and the extrusion department. In these departments is concentrated all of the heavy equipment, and servicing of that equipment is much more handy from such a centrally-located maintenance operation.

Shipping dock on the south side of the main plant building is truck-high, to provide easy loading and unloading of materials. The compound building is at truck and freight car height throughout, with a 10-ft. covered concrete platform around three sides of the building. Wherever trucks are supposed to load or unload, there has been provided a paved area sufficiently large to accommodate "turn-around" of large semi-trailer units.

In laying out the office space, considerable thought was given to the relationship between offices, lobbies, and general office areas. This office building had to be planned to be as functional as possible, yet adaptable to easy and trouble-free expansion the same as the plant structure.

Main entrance to the office is located somewhat off-center. Reason for that was to concentrate access to various offices and general areas to one side of the building, so that the general office area would not be disturbed by guests and visitors parading through the center portion.

A partition bounds a portion of the west and south sides of the office. This allows a through aisle from the Purchasing Agent's office, the lobby, the General Manager's office, and the Sales Manager's office to the factory, without disturbing activity in the general office area.

Personnel office is at the extreme northwest corner of the building. It has its own separate lobby, so that persons applying for positions will not have to go through the main office or lobby. Such persons can be completely processed in the Personnel Department.

BUILDING FEATURES...

LIGHTING

In the plant, four-foot Smoot-Holman fluorescent fixtures are used. Many were brought from the Vernon plant, and the balance were purchased for this use. Light intensity in the plant is 25 foot candles at working height.

In the office, 8-ft. Sylvania slimlines, egg-crate louvered, are employed, to afford 60 foot candles at desk height.

Daylight enters the plant through windows that take up about 20% of the floor area, even though Los Angeles County Building Code specifies only 12½%.

ROOF

Plant and office roofs are supported by 2" x 10" rafters, 24" on centers, topped by one-inch sheathing. On top of the sheathing is laid four (Pioneer Flintkote) 15-lb. felts mopped solidly together, and 300 lbs. of white gravel per 100 sq. ft. of area. Roof on the compound building is corrugated iron on structural steel.

STRUCTURAL STEEL

Compound building was purchased separately as a complete building from

Pacific Iron & Steel Co., Los Angeles. It is a rigid type of construction, and somewhat redesigned before assembly for this operation.

FLOORS

Plant floors are all five-inch reinforced concrete, with ⅜-in. round bars 24 in. on centers, both ways. A hardener was applied to the entire surface in the plant.

General office area floors are of asphalt tile (Tile Tex), Group C. Two executive offices have parquet floors. All toilets have terrazo floors, with a four-foot wainscoating.

COLOR SCHEME

Fuller paint is used throughout, with roof and walls inside painted a light seafoam green, and a dado (4½ ft. up from the floor) painted a dark green.

CEILING

Armstrong ½-in. cushion tone acoustical tile is used on office ceilings, to deaden sounds and make a pleasant working atmosphere.

PARTITIONS

In the plant, offices are constructed with movable partitions made by Weber Showcase & Fixture Co., Los Angeles.

WINDOWS

All sash is steel, made by Detroit Steel Products, with exception of openings in the monitors, which are provided by Lawrence Steel Co., Los Angeles.

WALL PANELS

All concrete in this plant is the usual 1-2½-3½ mix. Concrete for panel walls, however, has a somewhat lower water-cement ratio, with only 5-5½ gals. per yd. of concrete rather than 6½. Dreyer electric vibrators were used when pouring. Result is that these Panelcrete walls will test 4,000 lb. and up per sq. in.

Victor cement, readymix, was made under supervision according to architect's specifications.

Inside plant walls and some of the office walls are plastered on ⅜-in. buttonboard. Office walls that are not plastered are decorative, and of wormy chestnut.

GLASS

All sash are glazed with a product of Mississippi Glass Co., handled in Los Angeles by Malone Glass Company.

DOORS

Four steel rolling doors are in the plant, all by Lawrence Steel Co., of

Main operating room; in foreground is inspection department, trim department next behind it, and duct division to the left.

General office area has desks face north so people entering from south end will only disturb people to that depth of room.

Storage area inside the compound building. Mixing mill is in room at left. Entire area is kept suprisingly clean.

Boiler room and power plant area is in a good location for efficiency. (See plant diagram.)

Los Angeles. They are all operated by electric motors.

PLUMBING

In the plant there are five Bradley wash fountains, 9 showers, and 13 toilets, all Standard fixtures. Office plumbing is by Standard.

COMPRESSED AIR SYSTEM

One Chicago Pneumatic and one Gardner-Denver air compressor, each with capacity of 155 cu. ft., supply 100 lbs. of air pressure to 2,500 ft. of black pipe and over 500 ft. of air hose. There are over 75 air outlets in the plant at locations most handy for constant use. Duplex air servers, by Cox Air Systems, such as are found at your corner filling station to handle air and water hoses, are spotted at the hot presses (38 of them), to supply air and mold spray solution.

SPRINKLER SYSTEM

A Grinnell Sprinkler system is installed throughout the plant and offices. In addition, every 150 ft. in the plant there is a hose reel containing 75 ft. of 1½-in. hose, connected to the sprinkler system.

MATERIALS HANDLING EQUIPMENT

Inasmuch as 100 to 125 jobs (custom) are generally running through each department (Airtron ducting, and rubber goods) it was not considered expedient to install much built-in materials handling equipment. Hence, about 150 ft. of American Monorail trolley gear, one Towmotor fork lift truck, and 120 ft. of Mathews gravity roller conveyor (in the compound) constitute all that type of mechanism. That conveyor is hydraulically operated to deliver material at the proper height in the compound.

PIPING

Pipes that run through the plant (gas, air, water, steam, etc.) are not suspended from the ceiling according to the usual custom. Angle-iron crossbars about four feet long are affixed to steel I-beam columns at a point close to the steel I-beams used as rafters. These crossbars support most of the pipelines in the plant.

HEATING

Steam heaters are spaced through the plant every 40 ft. in each bay, 60 ft. wide. These heaters operate with waste steam that has once gone through the hot press line. In the office building, a forced air heating and cooling system, thermostatically operated, controls the atmosphere. Engineering offices and laboratory in the plant are serviced by air conditioning equipment made by Utility Evaporative Cooler. That equipment is also thermostatically controlled, both for heating and cooling.

Other Participants In Arrowhead Project

List of sub-contractors and materials used on Arrowhead Rubber Co. construction:

PIPING—*F. C. Schilling, Inc.*
- Pipe ..... *Crane Co.*
- Fixtures ..... *Standard*
- Valves ..... *Ohio*

SPRINKLER SYSTEM—*Grinnell Company*
- Pipe ..... *Kaiser*
- Valves ..... *Reading, Pratt & Kady*

PLASTERING—*Doyle & Goodman*
- Stucco ..... *Blue Diamond*
- Lath ..... *U. S. Gypsum*

ELECTRICAL—*M. Thomas Electric Company*
- Conduit ..... *General Electric*
- Panelboard ..... *Square D*
- Wire ..... *Paranite*
- Fixtures ..... *Lumidor*

HEATING—*F. C. Schilling, Inc.*

List supplied by the building architects and contractors, Buttress & McClellan, Inc.

BOILER ROOM

Two Dixon Scotch Marine type boilers provide steam pressure. These boilers have completely automatic combustion control, and they are designed to operate on either gas or fuel oil. The control panel is the essence of simplicity; flick of a toggle switch is all that is necessary to switch fuels. The two boilers are Dixon: one 100-hp., and one 150-hp.

Cooling water for mills and presses consists of a continuous flow cooling water system with two Fairbanks Morse cooling water pumps rated at 80 psi. Considerable attention has been given to the treatment of boiler feed water and the hydraulic and cooling water, in order to reduce maintenance costs to a minimum.

A Jennings vacuum pump removes condensate from the steam heating system and puts it back in the boiler. Shand and Jurs liquid level controls are installed on the boiler feed water tank, and Powers steam regulators control the system. Two Pacific Pumping two-stage turbine pumps supply boiler feed water.

Cooling and water systems are treated by a Renauld Crescent water softening process, and soluble oil is added to inhibit rust and corrosion. An evaporative condensation system is used on the mill cooling system instead of the old style cooling tower, to prevent algae and other contaminates from entering the system.

HYDRAULIC SYSTEM

Complete, fully automatic low and high pressure hydraulic systems have been provided. Low pressure (for blowing out molds) is maintained through a centrifugal pump operating at 300 lb. pressure through an air loaded accumulator. The high pressure system (for exerting pressure on molds) is maintained through a triplex pump. This unit obtains its suction through the 300-lb. system and boosts it (by an Ingersoll-Rand two-stage air compressor that maintains an air head on the system) to 2,000 lb., and keeps this pressure automatically within extremely narrow limits.

The hydraulic system is so designed that pressure is automatically controlled through an air-loaded accumulator to within five pounds of the desired pressure at all times, regardless of demands on the system. Hydraulic control valves are by Fischer; hydraulic control instruments are Foxboro.

ELECTRICAL SYSTEM

Design and planning of the plant electrical system reflects the most modern conception in electrical design and engineering. Bulk power is purchased from Southern California Edison Company, and the entire factory operates on a 440-volt, three-phase system.

Transformers for light and power are distributed throughout the plant in such a manner as to effect the most economical possible distribution of power. This electrical system is unusual in that no switches are used in the main circuits. Instead, overload reset type circuit breakers are provided for control and circuit protection. The electrical system is planned for maximum flexibility in order to allow for future expansion or re-arrangement of equipment. Square D control equipment controls the system.

PARKING FACILITIES

Over 75,000 sq. ft. of paved area is provided, including parking facilities for at least 175 cars.

FENCE

About 2,180 ft. of six-foot chain link nine gage steel Cyclone fence surrounds the property. Factory parking lot is fully fenced and all entrances and exits must be made through a designated door.

GROUNDS

Ground areas around the office building are covered with ivy and camellias, instead of grass.

USE ATOMS IN YOUR PLANT

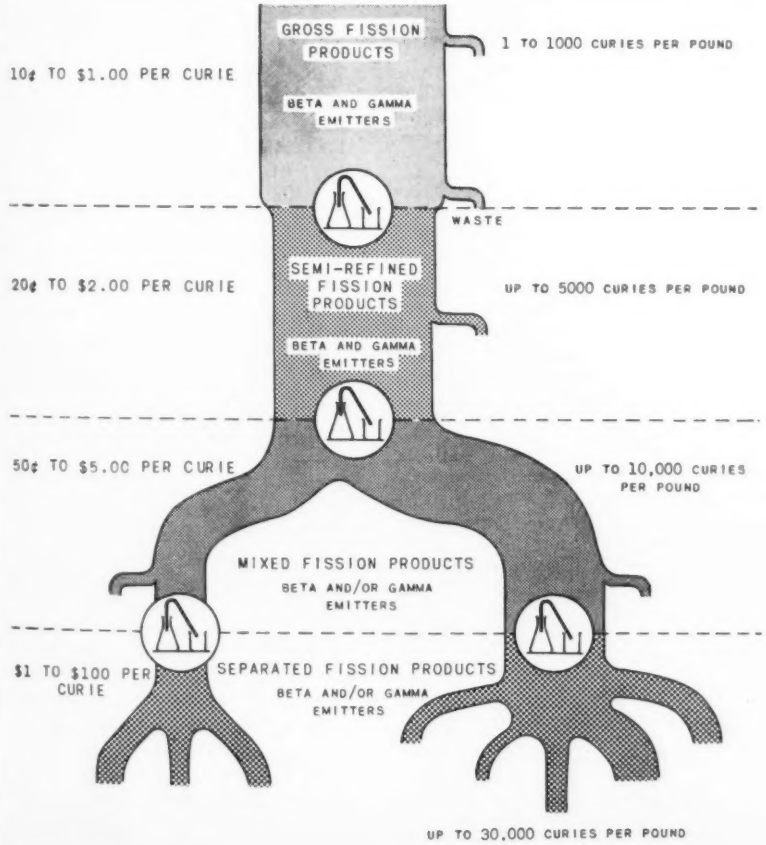
Fission material at Hanford cheap, in large quantities. May result in radical industrial process changes.

Lifting radioactive piston ring (on long stick) out of shielded locker in Calif. Research Corp.'s "hot lab."

INDUSTRY in the West naturally has some pertinent questions that it would like answered as to what good it may derive from the recently-announced industrial survey, instituted by the Atomic Energy Commission, of likely large-scale uses of fission products.

Entirely new economic possibilities for the use of radioactive materials are injected into the situation by this move. Why? Because it offers the opportunity to obtain crude unprocessed fission materials within a range of 10¢ to $1 a curie (a quantity of any radioactive material giving 3.70×10^{10} atomic disintegrations per second), as compared with $20,000 a curie for radium.

Radioactive materials possibly available from gross fission products. Radioactivity in curies per pound is dependent on source, age and composition of fission products.


GROSS FISSION PRODUCTS
BETA AND GAMMA EMITTERS
1 TO 1000 CURIES PER POUND
10¢ TO $1.00 PER CURIE
WASTE
SEMI-REFINED FISSION PRODUCTS
BETA AND GAMMA EMITTERS
20¢ TO $2.00 PER CURIE
UP TO 5000 CURIES PER POUND
50¢ TO $5.00 PER CURIE
UP TO 10,000 CURIES PER POUND
MIXED FISSION PRODUCTS
BETA AND/OR GAMMA EMITTERS
$1 TO $100 PER CURIE
SEPARATED FISSION PRODUCTS
BETA AND/OR GAMMA EMITTERS
UP TO 30,000 CURIES PER POUND

Stanford Research Institute, a peculiarly Western organization set up primarily to service major applied research needs of the growing West, has been selected by the Atomic Energy Commission to make the survey. One reason that so young an institution as Stanford Research was chosen, rather than Armour, Battelle, Mellon or others, was that Stanford is the first institute of its kind having a separate department of industrial economics.

The West also may feel some proprietary interest in the situation because the expected supply of fission material is the Hanford Project at Richland, Washington, chiefly known heretofore as an atomic bomb production center. Now it has been made public that great quantities of fission material have been piling up as a by-product ever since the first atomic bomb was dropped on Hiroshima.

"Western Industry" Forecasts It

At that time *Western Industry,* in a feature article (September 1945) written after an editorial visit to Hanford, posed this question: "Who can say whether the Hanford Engineer Works, breath-taking in concept and purpose, and costly beyond all our Western steel, light metals, shipbuilding and aircraft facilities—$384,000,000 exclusive of the land involved—will be a factor in the peace-time economy of the West?"

That was an unavoidably vague question, for the Army and DuPont men then in charge at Hanford could not seem to envision anything but a military future for this vast establishment in the great open spaces of eastern Washington. At that time even the

military aspects of atomic energy were fantastic enough, but now, less than five years later, typical inquiries that may be made by Western industrialists are these:

1. What does this mean to us, right now or some years hence?
2. Should we make an immediate investigation of its possibilities?
3. Should we assign someone in our company, or our industry, to devote all or part of his time to studying potential uses?
4. Should we call in a professional research organization to make a report for us?
5. Is there any likelihood that our existing or planned facilities will become obsolete as a result of some of the discoveries that may be made?

Actually, the number of firms who would be directly interested today is comparatively small. Nevertheless, selling the future short is an extremely unintelligent procedure, as even the Russians and Chinese are beginning to discover. Consequently, it is desirable for everyone in industry in the West to take a look at the situation.

Who Can Use, and How?

First of all, who can use fission products, and how?

Although scores of possible uses have been suggested, no actual tests have been made, because the materials have not been available in large quantities. But Stanford Research Institute points out that extensive scientific experience with the qualities of other radioactive substances suggests certain possible uses for fission products, including the following:

Capability	*Examples of Uses*
Kill organisms	Sterilize food and drugs in containers without heat.
Induct chemical reactions	Produce new or cheaper chemicals.
Active phosphors	Produce new types of luminescent paints and tiles.
Ionize gases	Produce improved static eliminators and more efficient fluorescent lights.
Penetration and tracing	Photograph through solids (radiography). Trace pipeline flows.

"Industry may be offered an opportunity to tap large scale, low cost sources of radioactivity" says the prospectus prepared by the Department of Business and Industrial Economics of Stanford Research Institute. "Fission products are expected to be available in hundred thousand curie quantities. The cost should be substantially lower per unit of radioactivity than presently available sources. For example, the cost per curie of fission products in large quantities is estimated to be in the range of 1/100th to 1/1000th of the price of most presently available radioactive materials."

Big-League Proposition

But this is a big jump beyond today's scale of use of radioactive materials, which is in the micro-curie class, and there are only a few so-called "hot" laboratories. A "hot" lab is one set up in accordance with the procedure prescribed by the Atomic Energy Commission and conforming to various requirements of health and safety, waste disposal, and so on. Examples in the West are those of California Research Corporation and Tracerlab.

Standard Oil of California has put radioactivity to good commercial use in testing its lubricating oil. The amount of wear on piston rings is determined by having them irradiated and then checking the wear by Geiger counters without tearing down the engine. Standard also uses radioisotopes in marking the flow of oil through its

Some Western Users of Radioactive Materials

Western industrial, educational and government users of radioactive materials (except medical research) from the AEC are as follows:

ARIZONA

University of Arizona, Tucson (agricultural chemistry and soils)

CALIFORNIA

California Institute of Technology, Pasadena (chemistry and physics)
California Research Corp., Richmond
C. F. Braun and Company, Alhambra
Lane-Wells Company, San Gabriel
Pomona College, Claremont (chemistry)
Richardson X-Ray Service, Los Angeles
Shell Chemical Company, Emeryville
Stanford University (chemistry)
Technical Associates, Glendale
Tracerlab, Inc., Western Division, Berkeley
Union Oil Company, Los Angeles
U. S. Army, Corps of Engineers, Sacramento
U. S. Department of Agriculture, Western Regional Laboratory, Albany
U. S. Naval Damage Control Training Center, San Francisco
U. S. Naval Ordnance Test Station, Inyokern
U. S. Naval Radiological Defense Laboratory, San Francisco
University of California, Berkeley (engineering, chemistry, plant nutrition, soils)
University of California, Los Angeles
University of California, Riverside
University of Southern California, Los Angeles (chemistry)
X-Ray Engineering Company, San Francisco

COLORADO

Denver & Rio Grande Western Railroad Company, Denver (laboratory)
U. S. Bureau of Reclamation, Geology Division, Denver (research)

IDAHO

University of Idaho, Moscow (agricultural chemistry)

NEW MEXICO

New Mexico School of Mines, Socorro (physics)

OREGON

Reed College, Portland (physics)
U. S. Bureau of Mines, Albany (metallurgy)
University of Oregon, Eugene (physics)

UTAH

American Smelting & Refining Company, Salt Lake City
Utah State Agricultural College, Logan (agronomy)

WASHINGTON

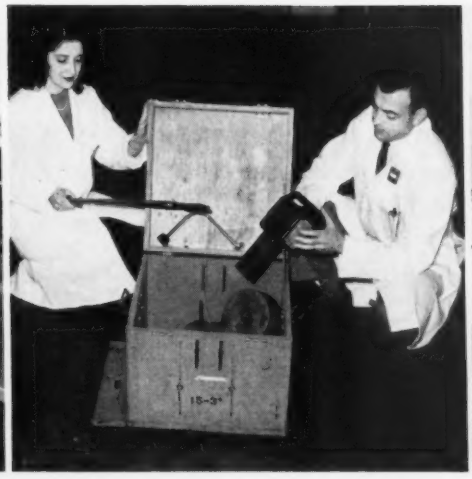
Gonzaga University, Spokane (physics)
Washington State College, Pullman (botany)

WYOMING

University of Wyoming, Laramie (physics, research chemistry)

Stanford Research Institute survey team. (Left), Lovewell, project leader and asst. chairman business and industrial economics department of S.R.I. (Center), Hosken, industrial market analyst. (Right), Cook, chemical engineer. Can they give you help?

Filtering dilute radioactive solution. Bench surface is coated with stainless steel.



Unpacking isotopes from Oak Ridge. Girl uses tongs. Man continuously monitoring operation holds the survey instrument or "cutie pie."

Obtaining quantitative measurements by means of Geiger counters or "auto-scalers." Photos by Tracerlab, Inc., Western Division.

Salt Lake-Pasco pipeline. In the March issue of *Western Industry* an article by Walter Offner of X-Ray Engineering Company pointed out that the AEC would irradiate about four piston rings a month for $43 (plus shipping charges, which are considerable, in view of the heavy lead containers and other safety devices required).

Radioisotopes, incidentally, may be obtained from AEC's Oak Ridge laboratory in micro-curie quantities. There are other sources of supply for ratioactive materials than the Atomic Energy Commission, but not on an industrial basis to any great extent. Radium, for example, is one, but its use is limited almost entirely to the medical profession and industrial radiography.

Many Angles Involved

Setting up a "hot" laboratory on a small basis is comparatively easy. Perhaps 100 companies in the West could do it. Some lead bricks and other shielding materials and equipment, and you can do small jobs, but to be able to handle fission products on the scale now being investigated would require a considerable investment.

Nevertheless, the actual investment required for such a "hot" lab would be within the range of many large corporations in the West. Perhaps $25,000 to $50,000 would cover it. But it would not be possible to turn an existing laboratory staff loose on the job of running it. Specially trained men are required, so there is an organization problem involved.

But a major policy and financial decision for even the largest of corporations would be required before setting up a laboratory equipped to take advantage of the fission products available at Hanford, because that is only the beginning expense.

Next would follow the pilot plant operation stage to determine whether the experiment were commercially feasible, followed by the almost unavoidable process shake-down in actual production operations. Then there would be new cost factors to consider, such as expensive installations for health and safety of workers, and the problem of storage of material, along with the fact that eventually it would lose enough of its radioactivity to be no longer useful, yet would still present a big disposal problem.

Stanford Research Institute's work, being carried on under the title of "Project 361" is for the primary purpose of enabling AEC to determine whether it is economically feasible to distribute the fission materials at all. If such distribution is feasible, the next question is what processing facilities to install in order to supply the material in the form desired by industry. When AEC is thus given an idea of where the big uses lie, it would be in a position to stimulate research in the right fields.

Prospectus Helpful

A prospectus covering the description of fission products, their possible industrial uses, availability and other considerations involved, has been prepared by Stanford Research. It is available to responsible companies with a legitimate interest in large-scale use of fission products, but as there are only a limited number of copies of the prospectus, they must be reserved for companies with a genuine interest at stake.

Logical steps for any organization actively interested are as follows:

1. Send for and study the SRI prospectus.
2. If large-scale use of fission products seems to have possibilities for you, make use of some applied research organization sufficiently versed in the subject to make an investigation for you.
3. If the results of the investigation seem to warrant specialized research which would put you in a position to make use of the fissionable materials, make arrangements to have the research carried on in some suitable establishment. Certain institutions have specialized in types of problems using other sources of radioactivity which would qualify them to handle specific jobs.
4. If you are satisfied with the research, and desire to carry on from there yourself, consider the advisability of setting up your own "hot" lab.

It will be 18 months or more before large quantities of fission products can be made available. Meanwhile the SRI team working on the project will make calls on a large number of representative companies in various industries across the country. Heading the team are Paul J. Lovewell, industrial engineer; Paul Cook, chemical engineer, and William E. Hosken, industrial market analyst.

Fission material is not a practical power source because of the low heat energy involved, so the SRI project is not concerned in any way with the developments in progress at Arco, Idaho.

Spraying the covering on with a common spray gun attachment. —*U. S. Navy photos.*

OLD SOL FAILS TO BURN UP AIRCRAFT

Navy finds spraying with latex liquid envelope and letting Arizona sun do its worst is better than either "cocooning" or "canning"

OUTDOOR STORAGE of naval aircraft in Arizona has been found to be superior from an economical standpoint to the other two known methods, "cocooning" and "canning," and after a two-year period the planes were in a satisfactory condition of preservation.

With the cessation of hostilities in 1945 it became desirable for the Bureau of Aeronautics to establish a suitable outside location for the storage of naval aircraft. The place had to meet certain requirements as to climatic conditions and be free from elements which would contribute to the deterioration of aircraft and their component parts.

Surveys throughout the United States were made and the U. S. Naval Air Facility, Litchfield Park, Arizona, was found to be nearest the ideal location from the standpoint of weather. Accordingly a few hundred planes were flown in and prepared for storage.

It was found that the fabric of the planes was adversely affected by direct rays of the sun, and it was thought they would have to be removed and stored indoors to insure preservation. But because of limited storage space and the great number of man hours required to remove and install the fabric surfaces, a more economical and practical method was required.

Borrowed from Ships

The Bureau of Aeronautics was consulted and recommended that experiments be made with a liquid sprayable latex material, commonly known as "liquid envelope," manufactured by the Better Finishes and Coatings, Inc., of Newark, N. J., and identified as strippable adhering plastic coating, aluminum pigment. This product had previously been used in the Navy's reserve fleets to preserve outside surfaces on board ships, but the idea of using it to preserve the fabric surfaces of naval aircraft was without precedent.

The liquid envelope was applied by the use of a common spray gun to the thickness of about .040 inch. Due to extreme temperature changes, ventholes in the fabric had to be opened to decrease internal pressure caused by trapped air. After several months the envelope was removed by hand without difficulty and the surfaces were found to be in a state of excellent preservation. As a result of adopting the "liquid envelope" process, a desirable degree of preservation, with economy, had been reached.

Ventilation Stops Rust

Selection of Litchfield Park was due primarily to relatively low humidity conditions, having an annual average of about 30%. This condition was extremely favorable to mechanical preservation, as rust to external exposed parts was practically nonexistent. Extensive experiments conducted proved that all external mechanical parts of an aircraft could be kept free from rust by the mere use of elemental ventilation.

The internal mechanical parts of the engine were preserved with a rust-preventive compound, manufactured by Becker Chemicals, Inc., of Ambler, Pa., identified as Factory No. L216-20, Navy Specification No. MIL-C-5545. A dehumidifying agent was then placed in the internal parts of the engine and the openings sealed.

Year Without Tuning Up

By the use of this method the engines are kept in a constant state of preservation for at least one year without turning up, and from all indications this method will extend the period an additional six months to a year. Methods previously used required the engines to be turned up at least once every six months. The saving in time and money has proven to be about 40% over other methods.

The amount of time and cost to maintain these aircraft at Litchfield Park, over a period of ten years, is estimated to be about 5% of the original cost and only about 2% of the cost to replace them. Many of these planes were quickly de-preserved and used in the present Korean conflict.

Liquid envelope is removed from fabricated surfaces by hand-stripping. Surfaces well preserved, and saving in time and money is about 40% over other accepted methods.

When Albers feed mill foreman Bob Bill dials two digits on this simple phone unit, feed line from storage bin is automatically connected up with right package line, while panel lights flash under the combination in use.

DIAL IT TO HOOK UP BIN WITH PACKAGE

KNOWN as 2A3 is an electric control panel in the cereals packaging department at the Oakland, Calif., Albers Mill. From it the conveyors, feeders and bins involved in the cereals line can be operated by dialing a series of code numbers.

This panel has saved Albers many hours, by stepping in at crucial moments and taking charge of equipment in the transfer of cereals from the bins where they are stored, through various refining processes, right down to the packaging line.

Stop Spills, Choke-ups

Prior to installation of 2A3 a few months ago, there was a serious problem of bin spills, elevator choke-ups, and a general loss of time and efficiency in the packaging operations.

The transfer system, which 2A3 controls, supplies the package lines with stock from the storage bins by means of a series of elevators, belt conveyors and gravity spouts.

Stock is first elevated from bins to the seventh floor, and spouted on a belt conveyor. Stock then goes to one of five sifters located on the sixth floor; it is then spouted from the sifters down to another system of belt conveyors located on the third floor. Conveyors then carry the stock to the supply tank above the desired package line.

Complicated System

All this sounds complicated, and it is. You can imagine what happens when one of the pieces of equipment in the middle goes haywire.

For instance, it is necessary to stop the feeders on the storage bins every time there is a shut-down on the package lines. Since the feeders are situated a considerable distance from the package lines, there was an interval—after the package line was shut down—before the transfer operator could get to the bin feeder to turn it off.

And during the operator's mad dash, the elevators sometimes choked up and the supply tank or belt conveyors spilled over. This, coupled with the delay before the package lines could resume operation, resulted in considerable material waste and time loss.

While such stoppages had been going on over a long period of time and were relatively few, Albers production men knew a foolproof system for controlling the various operations would easily pay for itself in time and materials saved.

"2A3" Is Devised

The idea of an electrical control system was conceived which, when installed, was identified as an "electric bin feeder control." The control panel developed is the system's nerve center and brain, 2A3. The key part of this panel is a telephone dial which operates the various bin feeders. There is also a switch at each package line connected directly with the bin feeder supplying that particular line. Now, whenever a package line stops, the operator pushes the switch and the bin feeder is immediately stopped.

Since it may be necessary to supply any one of the four package lines with material from any one of the nine storage bins, all of these possible combinations had to be considered in designing the control system. Each bin and package line combination is given a two-digit code number.

Dial for Blending

When the transfer operator wishes to draw from a particular bin to supply a given line, he merely dials that two digit code number and the feeder is automatically connected. This also connects the package line switch with the bin feeder. During the package line run the feeder is controlled by this switch.

To begin operation, the transfer man starts all the elevators, conveyors and sifters. Then he adjusts the spout valves so that the stream will go to the correct package line. And finally, he dials the control code number.

At that point, 2A3 goes to work. The panel is also equipped with lights which indicate which bins and package lines are in use. At the end of the run, all of the bins in use can be shut off by dialing a single code number. With this system it is also possible to dial in several different bins into a single conveyor and thus blend stock to produce a uniform product.

There was some fear at first that the 2A3 would be subject to disastrous breakdowns, complex being that he is. Such has not been the case. 2A3 has given continuous service without any need for repairs. It has also eliminated the spills and choke-ups that were so frequent before it was installed.

Along the assembly line, materials and fixtures are stored directly next to point of use to reduce costs of handling.

Finishing touches are added as Mobilhomes move toward end of conveyor where they are lowered on dollys for towing to site.

HOMES FROM PRODUCTION LINE

Industrial decentralization has a new friend in this system of building ready-to-live-in houses on an assembly line and towing them as much as 200 mi. to the site of your choice

DECENTRALIZATION of industry is one of today's economic watchwords. But when industry starts to decentralize, it has to think twice: (1) Where is our best location for raw materials? (2) Where is our best location for labor? Seldom do the two coincide in one location, with the result that industry has to settle for immediately available labor, and ship in the raw materials.

That picture is now starting to change, however. Industry in the West need no longer be bound to urban centers. It is no longer necessary to erect a plant in an area depending upon the labor supply. Industrial plants can now be put up far from urban areas, closer to sources of materials supply. Plants can be put up in the middle of an oil field, for example, and the community of workers spotted near the plant.

Fantastic? Not so. That is exactly what is happening today in the Cuyama Valley. Richfield Oil Company is having homes built in Bakersfield, California, and hauled 75 miles to the plant location.

A Boon for Decentralization

Erecting homes — building completely ready-to-live-in homes on an assembly line and then towing them as much as 200 miles to a prepared foundation and plugging them into utilities—may well revolutionize both industrial decentralization and the small size (26 x 50 feet) home building industry.

This method permits a prospective buyer to select a floor plan to suit his requirements, indicate what modifications he desires, and then live in his custom-built home within 20 days. Industry can thus better satisfy the workers it seeks to transplant to new locations.

Significance to Western Industry

Many aspects of converting such a custom-built article into a mass-produced one are of vital significance to Western industry. Here are factors that make this project successful:

1. Location near labor market. The assembly line is built where labor is available. The problem of transporting labor, always expensive, is eliminated.
2. Efficient utilization of labor. Each man has specific functions to learn, master, and repeat. His mechanized tools are at a certain place. Maximum efficiency results.
3. Labor is made more efficient by the use of automatic tools. The conventional handsaw has virtually been eliminated—many other mechanical aids make a craftsman a specialist and improve his efficiency.
4. Homes are built where materials are obtainable for the most reasonable price. By constructing the home where building materials and labor are best and least expensive, the operation is most profitable.
5. With the assembly line located near the source of supplies, better selection and control of quality materials is possible.
6. Instead of erecting an expensive plant, a comparatively inexpensive though adequate plant is built. Once the house moves out of the assembly line, the home's own roof and connected heater act as its own factory covering. Practically everything about the plant is portable.
7. The "production line" operates with a small inventory. With proper location, near supplies, these plants have an average materials turnover of eighteen times a year.
8. All work is done within a comparatively small radius. With closer

supervision, less supervision is necessary.

9. With the entire operation—sales, financing, supervision, purchasing, inventory, building — conducted within a comparatively small area, paper work and administration are reduced to a minimum.
10. An assembly line need not turn out mass-produced products alike. The result is that homes can be custom-built. Each home buyer can select his colors, floor plan, window placement, garage, to suit himself. This is achieved without an appreciable loss of time and results in thoroughly satisfied customers.
11. Best, perhaps, is the combination of purchasing power, talent, and pooling of ideas by member plants. Brains and "know-how" are commodities without price—and these can be had by working together. Ideas and methods are pooled through the home plant at Bakersfield — and then disseminated to each plant.

The fusion of these basic principles has intensified the concept that even with such an unwieldy assembly-line product as a home—an 18-ton object, with a size of 26 feet by 50 feet (smaller or larger)—the basic principles of manufacturing on an assembly line apply.

By utilizing the assembly line construction methods where building and materials are readily available, a manufacturer can now go into almost any area where raw materials are available, build his plant, and provide his workers with quality medium-sized homes at a considerable saving in price.

Transplanting Made Easy

Mobility of this type home assures its fixed value, whatever the location. Because the home is built to be moved to a foundation miles away, it can be moved once again should the usefulness of its particular location be exhausted. Hence, no more ghost residential areas in boom manufacturing towns.

In several instances, home owners with growing families have already traded in old homes for new. One man who moved to a new job picked up his home and took it along.

Great emphasis has been placed on making labor as efficient as possible. To this end, automatic machines have made it easier and better for the craftsman. For example, a dry-wall taping machine has reduced man hours approximately 25 per cent. An overhead crane lifts entire walls into position. Besides the time saving effected in materials handling, the carpenter sets his 2 x 4 studs on a jig and then nails downward, with greater speed than is otherwise possible.

A Hundred Short-cuts

There are a hundred and one other short-cuts which come readily to an observer. The entire floor of a home is sanded when the home is in the first position. This means that the 2″ x 12″ floor joists have been put down, bridge bracing has been done, and steel strapping has been put down in a double XX pattern over the floor joists. (The heavy floor joists and extra steel strapping are there to make the house good and strong for moving. The average home has 2″ x 8″ joists, without steel strapping.) Then the hardwood is nailed down. And before the walls are lowered into position by an overhead crane, the sanding machine performs the entire operation without once slowing up for awkward corners and walls. In this operation substantial saving is effected.

Materials Handling at a Minimum

Much of this overall saving is effected by analyzing the problem of materials handling and reducing it to a minimum. To this end, delivery trucks and lumber carriers deposit the materials within twenty feet or less of their eventual point of use.

Because the problem of getting materials to the roof involves a great deal of handling and lifting, a platform is built at roof level. Plumbing fixtures, window frames, sheetrock, water

Miles away from the production line, the completed home is planted on a prepared foundation. This doesn't mean it's there to stay. Once its usefulness at one location is exhausted, the house can be moved to another foundation near a new plant site.

Custom-built field offices, banks, etc., can be produced on the same assembly line. Customer can select his own floor plan.

Despite a certain amount of standardization, each home can be individual enough to satisfy living requirements of workers.

heaters, tile, electrical supplies, paint —all are stored in bins directly next to the position where they are used.

Another materials handling problem is solved by reducing waste to the minimum.

Other Savings

Measured lumber is used with squared ends holding resawing down to a minimum. For another saving, it is almost as cheap to use dressed lumber throughout the home as it is to use rough lumber. Matter of freight rates. So, the customer further benefits by getting better quality lumber in his home.

Finally, the major savings in materials handling is attained when the entire house is lowered on dollys and the approximately 18 tons of home is towed, at 15 to 25 miles an hour, to its site. Such distances, of course, vary from a few miles to as many as 220.

Other Advantages

On one occasion, a bulldozer had to cut out a road for several miles in the heavily rolling oil lands east of Bakersfield. For the conventional home, a hundred trips would be made with the lumber, paint, plumbing, tile, electrical equipment, cement, etc.

By having the home assembly line near main trucking and railway trunk lines, not only is materials handling reduced, but another large saving is effected by being able to hold the inventory down. Fast deliveries can be made when any particular product is needed. In fact, it is not infrequent to have a Mobilhome built, delivered and the money in hand before the bill comes due for the materials that go into the home.

Efficient purchasing of course is another part of the answer. By centralizing the purchasing for branch home plants, a great purchasing power is set up. And naturally, better materials can be obtained for less money.

METAL STITCHING SAVES OVER DRILL-AND-RIVET

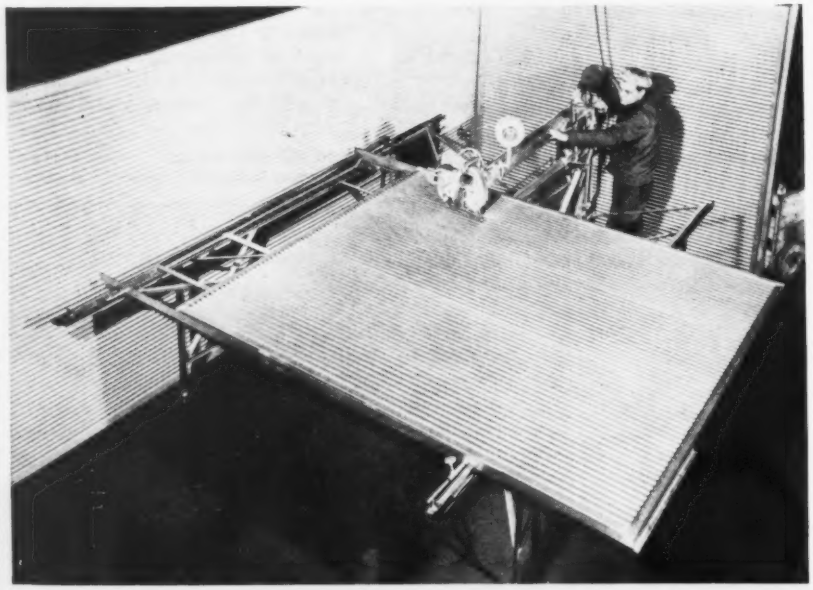
METAL-TO-METAL stitching is presently saving as much as nearly $2.00 per door manufactured at Tomfohr Overhead Door Co., Portland, Ore., in comparison to their former method of drilling holes and riveting. Actual costs were slashed from $3.33 per unit produced to $1.04.

In casting about for an economical way to accomplish the desired objective, they tried spot welding. That is an exceedingly difficult operation, however, and a special preparation must be prepared for the material. Embossed aluminum they found impossible to spot weld.

They tried rivets, too, but discovered that (1) with rivets more or less guess work is involved, and (2) at times, some rivets would drop out entirely, causing the door to be placed in a reject pile. One door in ten, as an average, for example, would have defective rivets. With metal stapling, they do not reject one door in fifty for that cause.

Close-up, showing place stitch and man operating machine from one station control point. Small round tube in foreground of stitching head is a small electric light, affording clear view of work at hand. Small round ball on double rod in foreground is a marking gage.

The entire set-up, below. Machine was rebuilt from floor model Acme stitching machine by cutting casting between head and flywheel and extending throat to 4 ft. so that reach extends to center of 8 by 8-ft. door. Lever on back of machine can move table in four directions and drive staples without operator changing hands.



Here is a tabulation showing difference in cost to Tomfohr between using rivets and stitching:

Staple cost: 125 stitches per door (1¼" staple) $113.25 cwt., 18 ga. stainless steel wire—total $0.087375.

NEW METHOD

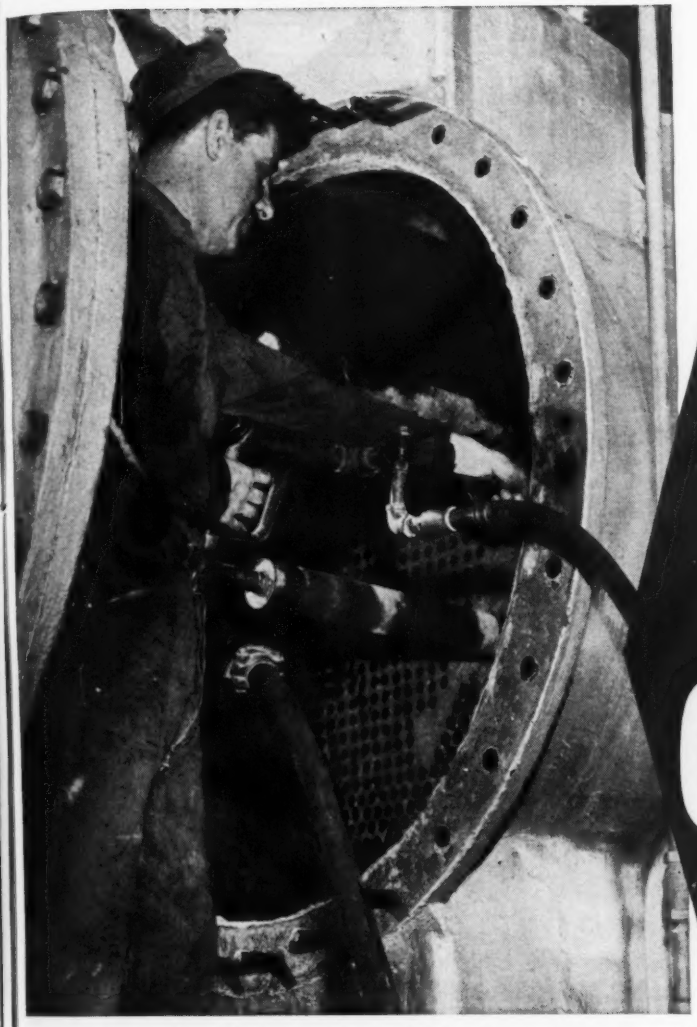
Material	$0.087375
Labor	0.95
	$1.037375

Labor, 45 minutes for one man to stitch one door. One man turns out 12 doors per eight-hour shift.

OLD METHOD

Material	$0.33 (rivets)
Labor	3.00
	$3.33

Labor, 55 minutes for two men to drill and rivet one door. Two men turn out nine doors per eight hour shift.



Condenser Tubes must be... KEPT CLEAN

Newport shoots the brushes through the tubes with an air-water gun at 75 lbs. per sq. in. They come from the far end like projectiles. Another Revere contribution was to assist in the design of a target to stop the brushes without damage.

● Condenser tubes almost immediately acquire a film that protects the metal from corrosion. Such film is thin, and beneficial. If it does not form, the probability is that the wrong alloy has been selected. It is part of Revere's service to collaborate with you in selecting the alloy that will be most economical in the long run.

There is another and much heavier type of formation within a tube that impairs its operation, or shortens its life, or both. This is the deposition of foreign matter such as shells, which may cause erosion-corrosion effects, and the growth of organisms such as algae. The latter materially reduce heat transfer.

Take the case of the Newport Electric Corporation, Newport, R.I. Its condensers are cooled by harbor water, with the result that algae and other marine organisms coat the tubes, reducing efficiency, lowering the vacuum, and increasing fuel consumption.

This utility is exceptionally well managed, with a systematic tube-cleaning program. However, it found that brushes and rubber plugs used for cleaning wore out quickly. Revere took a close interest in this problem. One of Revere's customers makes nylon brushes for cleaning tubes in dairies, and it was suggested that a modification of these be tried. Results: over 300 tubes cleaned per brush, a much longer life than anything previously used, and a half-inch gain in vacuum, meaning dollars and cents saved in fuel.

Revere makes condenser tubes and plates in all the usual alloys, and is glad to collaborate not only in specification, but in other condenser problems, as this case history shows. We are only too glad to work with you on any matter involving condenser and heat exchanger operation. Our wide experience, and contacts with many industries will be made freely available to you. Write the nearest Revere office.

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COPPER AND BRASS INCORPORATED

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Canning perishable foods for year-around consumption is one of the largest and most vital uses for steel. 400 food cans are opened, emptied and thrown away by the average Western family every year!

It takes a mountain of steel to feed you well—

The Western family "eats up" 400 cans a year!

You need 750,000 tons of steel to give Western canners and food packers a year's supply of tin cans. This tonnage is enough to make three bridges the size of the San Francisco-Oakland Bay Bridge, longest in the world. And much of this steel is shipped by Columbia Steel Company, only producer of tin plate this side of the Mississippi, and largest source of all steel products in the West. For Columbia is the Western producing member of the industrial family that serves the nation—United States Steel.

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San Francisco • Los Angeles • Portland • Seattle • Salt Lake City

UNITED STATES STEEL

Fourth in a series on water problems

RIGHT CHEMICALS MAKE WATER AS YOU WANT IT

By RAY W. HAWKSLEY, Chemical Engineer, San Francisco, Calif.

THE PRECEDING discussion in this series covered external treatment of industrial water, as differentiated from treatment with additive chemicals.

External treatment methods, particularly for boiler feedwater, have certain limitations, and usually must be supplemented by the addition of proper corrective chemicals. (In some cases, the whole treatment job can be done by internal treatment alone, as was indicated in some of the water analyses given in the first two articles.)

There are several common impurities in boiler feedwater which cause difficulty. These are:

Hardness—causes scale.

Alkalinity—causes foaming, and possible caustic embrittlement.

Silica—causes scale.

Dissolved oxygen—causes corrosion.

For each of these, there are recognized corrective treatments, as will be explained below.

Know the Cause of Scale

What causes scale in a boiler? Primarily scale is a deposit of calcium carbonate and to a lesser extent, calcium sulfate. Other substances may also be present.

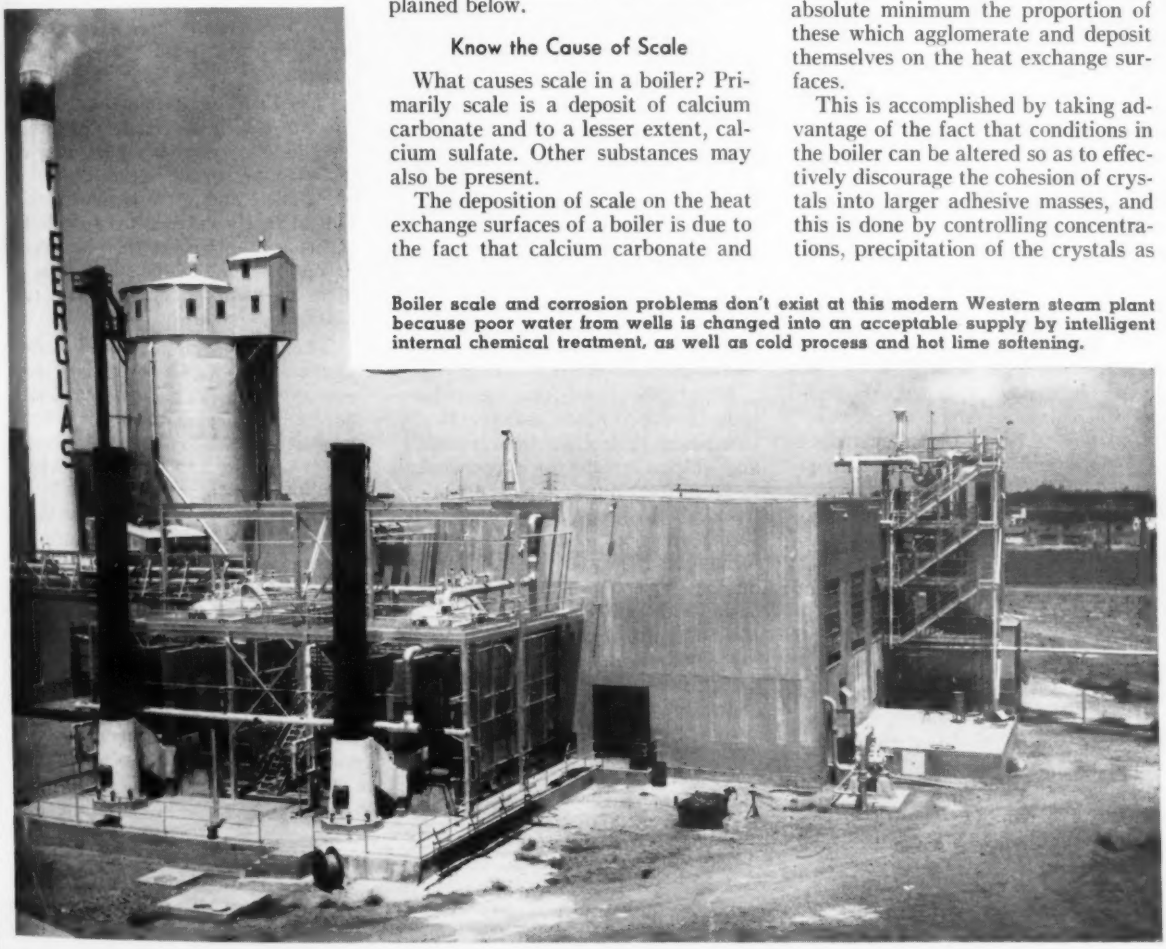
The deposition of scale on the heat exchange surfaces of a boiler is due to the fact that calcium carbonate and calcium sulfate have the peculiar property of being *less* soluble as temperature is increased. Or in other words, these substances are said to have a "negative solubility curve." The result is that as the feedwater is heated in the boiler, these salts come out of solution as solid crystals, and under certain conditions will deposit themselves on the metal surfaces of the boiler, usually in the tubes.

If no treatment at all were used, and matters allowed to proceed without control, the "encrusting salts" in the feedwater would start to come out of solution as solid crystals in accordance with the natural laws governing solubility. A certain proportion of this crystalline material will fall harmlessly into the mud drum, and be blown out as sludge. However, another portion will deposit itself on the tubes. How *much* will so deposit itself depends on circulation rate, temperature, and a number of other factors.

The Aims of Internal Treatment

The aim of internal chemical treatment is to increase as much as possible the proportion of crystals settling to the mud drum, and to reduce to an absolute minimum the proportion of these which agglomerate and deposit themselves on the heat exchange surfaces.

This is accomplished by taking advantage of the fact that conditions in the boiler can be altered so as to effectively discourage the cohesion of crystals into larger adhesive masses, and this is done by controlling concentrations, precipitation of the crystals as



Boiler scale and corrosion problems don't exist at this modern Western steam plant because poor water from wells is changed into an acceptable supply by intelligent internal chemical treatment, as well as cold process and hot lime softening.

phosphate or carbonate (to the exclusion of sulfate), and the use of various organic anti-cohesion agents.

Formation of scale is aggravated if blowdown rate is too low, as this in turn produces high concentrations of scale-forming salts in the boiler water. Therefore, adjustment of blowdown rate to proper values is always part of well engineered water treatment.

Silica scale is usually found combined with other types, and is very undesirable due to the fact that such scale is almost always very dense and hard, and almost impossible to remove. Western water supplies contain more silica than is usual in other sections of the country, and some very high silica content water is found in some locations on the Pacific Coast. Western plant operators therefore need to be especially alert to the problems which may arise with water supplies containing abnormal amounts of silica.

Eliminating Silica Scale

The formation of silica scale is controlled by reducing the content of silica in the boiler water below critical limits through the use of proper blowdown rates, and by adjustment of the alkalinity in the boiler water in order to keep silica in solution.

It will be seen that protection of a boiler from scale is a rather complicated matter. The use of "cure-all" boiler compounds usually leads to disappointment because water supply, operating conditions, steaming rates, and many other pertinent factors vary widely from plant to plant.

Modern water treatment technique is based on careful study of all relevant conditions, and establishment of a controlled system of corrective treatment. The costs of such properly engineered treatment systems is almost always more economical and satisfactory than the use of "simple" patent-medicine-type boiler compounds.

Embrittlement of Boiler Metal

Caustic embrittlement of boiler metal has received considerable study. It is caused by a combination of conditions—local high concentrations of causticity, at a point of stress in the metal. This will occur, for instance, at a riveted joint, and manifests itself by failure of the metal. Microscopic examination shows separation along grain boundaries. This is a condition which is now less important than formerly, because modern boilers are welded and stress-relieved, thus removing one of the necessary conditions for the occurrence of caustic embrittlement.

Foaming is a troublesome difficulty, and sometimes seriously limits the amount of steam which can be produced. Foaming is caused primarily by too high a concentration of dissolved solids in the boiler water, and is aggravated by the presence of excessive amounts of *suspended* solids. Some boilers are more prone to foam than others due to their basic design, and will foam easily under sudden increases in steaming rate.

How to Minimize Foaming

Foaming can usually be minimized or eliminated by high rate of blowdown, which reduces dissolved and suspended solids below critical concentrations. However, this procedure is wasteful of fuel, and reduces the effective steaming capacity of the boiler.

New types of anti-foam agents have been developed which have practically eliminated difficulties from foaming, and which allow the use of economical rates of blowdown. Their action is based on the fact that they alter the surface tension of bubbles of foam forming at the water line, causing the bubbles to collapse. Whereas previously it was not safe to exceed a value of 3,500 ppm. of total dissolved solids in the boiler water at a pressure of 300 psi., it is now possible through the use of anti-foam agents to operate a boiler at this pressure and allow the solids to rise to as much as 15,000 ppm.

Chemicals Chase Corrosion

Corrosion within the boiler is caused usually by the presence of dissolved oxygen in the feedwater. The oxygen is expelled under the heat or the boiler, and attacks the metal of the boiler, particularly in economizer sections or at the point of entrance of the feedwater in the upper drum and first pass. There are two general methods of attack on this problem, mechanical and chemical.

Since the solubility of oxygen in water depends on temperature, the hotter the feedwater is heated before entering the boiler, the less oxygen will remain in solution. Thus, the use of an efficient feedwater heater will greatly reduce dissolved oxygen.

However, a trace of oxygen always remains even under optimum operating conditions, and this can be completely eliminated chemically by the use of sodium sulfite in sufficient quantity to assure complete elimination of the residual oxygen. At ordinary operating pressures (below 1,400 psi.), no harmful effects result from the use of sulfite.

Stopping Rust from Steam

A more serious type of damage, and one which annually causes millions of dollars' worth of damage, is rusting of plant equipment in which steam is condensed, and return condensate lines. This corrosion is caused by the action of carbon dioxide, and is accelerated by the presence of oxygen in the steam.

When carbonates and bicarbonates are present in the feedwater (which they almost invariably are), they decompose under the action of heat in the boiler, and form carbon dioxide gas. This is carried over with the steam, and into all of the plant steam system. As long as the steam is in the state of gas, no corrosion will take place.

Thus, *steam* lines very seldom show any evidence at all of rusting. However, as soon as the steam condenses, as for instance in a steam jacketed cooker, the carbon dioxide dissolves in the condensate and forms a weak solution of carbonic acid which is extremely corrosive. The corrosion manifests itself throughout the return line system, and usually is found as a characteristic *grooved* type of damage, particularly at angles and bends.

There are two general solutions to this problem. The first one is to remove the carbonates and bicarbonates from the feedwater before it enters the boiler, so that no decomposition into carbon dioxide can take place.

This can be done by external treatment methods in several different ways. The simplest is to feed sulfuric acid to the feedwater ahead of the boiler, in sufficient quantity to neutralize all carbonates present, forming the corresponding sulfates and carbon

Reprints Wanted?

THIS is the fourth of a series of articles dealing with water as used in industry in the West, and if our readers are sufficiently interested, reprints of the series will be made. Readers are requested to advise whether reprints will be desired. Because these articles deal with Western conditions, they are valuable for reference purposes.

The first two articles dealt with the industrial qualities of water, and included a tabulation of water characteristics in a large number of Western cities.

Water treatment, types of water softeners and the effect of various methods of treatment were covered in the third installment, and the fourth deals with boiler feedwater treatment.

The fifth article, which will appear in the May issue of *Western Industry*, will be devoted to water conservation.

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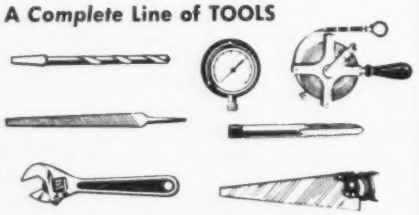

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dioxide. The latter is removed in a degasifier.

Alternatively, the effluents of a hydrogen cycle and a sodium cycle zeolite softener can be blended in such a way as to achieve the desired neutralization, and again the resulting carbon dioxide removed in a degasifier. Still another method, applicable under certain conditions, is to treat the feedwater with a hydrogen cycle zeolite alone, and adjust the acid effluent with caustic to the neutral point, or beyond as desired.

Use of Amine Compounds

A completely different approach to the problem is to allow carbonates to remain in the feedwater, and undergo decomposition to carbon dioxide in the boiler, but to offset the resulting corrosive condition with the use of corrective chemical agents. These are usually amine compounds, and are of two different types.

In the *neutralizing* type, the amine is fed to the boiler in the feedwater, is volatilized without decomposition, and passes over with the steam. When condensation takes place, there is a neutralization reaction between the amine and the carbon dioxide which prevents the formation of carbonic acid, and therefore prevents corrosion damage. This type of treatment does not, however, eliminate damage from dissolved oxygen, if present in the steam.

In the *filming* type amine, no neutralization is sought for, and the aim is to create a protective film over the metal.

Costs vary considerably as between these different methods of protection against corrosive condensate, and an economic study should be made before any particular one is adopted.

Gas Appliance Sales Zoom to New Records

ALL RECORDS for gas appliance sales on the Pacific Coast were broken in 1950. A rough but conservative estimate made by the Pacific Coast Gas Association is as follows:

	Units	*% Increase*
Gas Ranges	310,000	30
Water Heaters	450,000	60
Central Furnaces	50,000	30
Floor and Wall Furnaces	250,000	25
Direct Heaters	145,000	60

The smaller percentage increase in the sale of heating equipment on the Pacific Coast as compared with national sales may be due to the very high saturation already achieved here. The rapid spread of natural gas service to eastern points has opened up a new market.

To Save Money on Speed Reducers

BUY PACIFIC-WESTERN *STOCK DESIGNS*

You can lower your plant-equipment costs by selecting a stock-design speed reducer for new or replacement purposes. You also save delivery time. A wide variety of types of Pacific-Western speed reducers—covering most industrial applications—is available either from stock or with minimum manufacturing lead time. Ask your nearest Pacific-Western sales engineer to show you how you can avoid the cost and delay of special tooling or engineering *where it is not necessary.*

This single-reduction, parallel-shaft herringbone reducer, shown with cover off, is one of the Pacific-Western stock designs available in many standard stock ratios and in a wide range of horsepower capacities.

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The mechanical features of this reducer represent the experience of fifty years of gear-making design and production. You will find tested and proved quality in every speed reducer in the Pacific-Western line. Complete mechanical details and specifications are given in Bulletin 4802, "Herringbone Speed Reducers." Use the convenient coupon to obtain your complimentary copy of this 48-page book.

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PAYS TO ORGANIZE, ANYWHERE

An example of how even small plants can profit from intelligent administrative planning and avoid painful "happy family" drawbacks

"ORGANIZATION? Cooperation? In our company? Why certainly!" That's almost the stock answer from any small businessman, who is proud of his firm.

"Here—look at these charts. They tell the story." They do, too. Fine charts. Well laid out. Pretty design, showing things as they are supposed to be.

But who uses them? How accurate are they? And do they tell the *real* story? Surveys have shown (*Western Industry* conducted one just last year) that businesses seem to think that charts are fine to look at, but beyond that point they tend to lose interest. They are too much trouble to keep up and use.

Small businesses, in particular, seem to have an idea that a "happy family" type of operation doesn't require any particular administrative direction, and that all is well in the plant simply because nothing appears to indicate otherwise.

A Case in Point

Let's take a case in point and see just how both organization and cooperation in the right way can make a small business pay fruitful dividends. This instance, a classic example, points out the value in unmistakable profits.

California Wire Products Company, in Visalia, California, was incorporated in March of 1949, when a number of enthusiastic stockholders decided to invade the business of manufacturing industrial wire staples and machines to apply them (known in the trade as "tackers").

Calwire ran along under its own power and momentum for one year, but without well-defined organization. Then organization and cooperation both entered the front door at the same time. They immediately went to work, and here is a quick rundown of results accomplished at the end of the firm's second year of operation:

	First year's operation	*Second year's operation*
PROFIT	None	Net profit existed
SALES	Not disclosed	300% increase
DEFICIT	Existed	None
LOANS	Existed	None
DIVIDENDS	None	20% On period 3/1 to 9/1
CREDIT	None	Excellent

That's the story, in a nutshell. This is how that marvelous record was accomplished:

On February 8, 1950, William C. McMullin entered employ of the firm as sales manager. At that time, McMullin was entirely new to the staple business. He knew nothing about it, as such. But army training had given him a good insight into methods of organization, and administrative duties in the military service had taught him the value of cooperation.

Applying Past Lessons

After four hours of indoctrination from the outgoing sales manager, he assumed the duties of that office and started on his own. He continued in that capacity for a month, watching, learning, struggling with the young company.

Then, in the following month, on the firm's first anniversary, Calwire's board of directors appointed him vice president and vested him with the additional duty of general manager. That position included all administrative, production, and purchasing responsibilities—in addition to selling. He was, in fact, replacing two former officeholders.

William C. McMullin as general manager found it paid off to establish good but simple organization methods in this small plant.

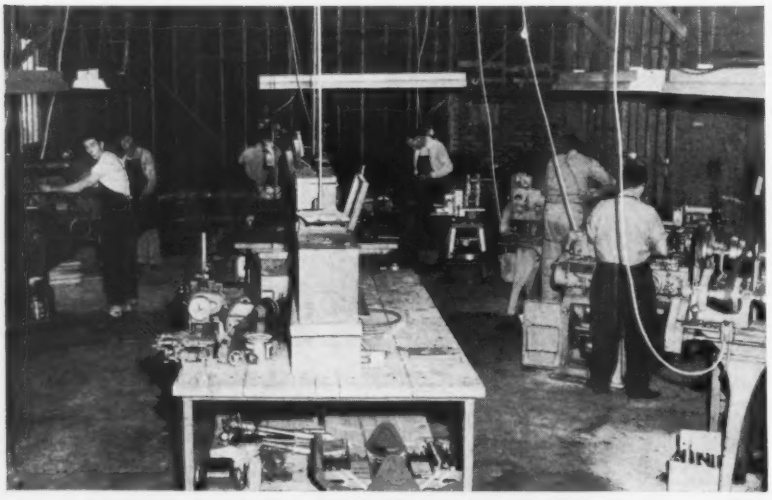
During his first month's tenure of office as sales manager, he had detected the source of a few troublesome things that needed correcting. Now, cloaked with proper authority, he set about correcting them, one at a time.

Chart Establishes Responsibility

Prime consideration was given to development of a Position and Organization chart of operations, which chart was approved by the board. That chart, in itself, (1) set up a line of authority, and (2) established responsibility.

Until that time, no definite line of authority had existed. The former general manager had had no authority to direct activities of the sales manager. And the sales manager received

By getting distributors to handle minor repairs, instead of returning everything to the factory, the machine shop employees were able to concentrate on productive work.



his orders from the board of directors.

Further, the general manager would not increase the number of work hours to meet an increased demand for Calwire's products. He was steadfast in his belief that one eight-hour daily shift on machine production was enough.

One immediate and inevitable result of this action was development of a large backlog of orders that was constantly growing larger.

In the front office, internal friction between the salesmanager on the side of administrative management, and the general manager on the side of operating management, split the stockholders into two opposing camps. Constant bickering and distrust cropped up. Factory employees, who could sense difficulty in the ranks of top brass, tended to lose confidence and become dissatisfied. Production consequently suffered even more.

Office Procedure Organized

At about the same time that the chart was approved, all employees who were displeased were released. They were replaced by new faces, both in the plant and in the office.

Immediately a "new look" crept into that firm. Problems between labor and management dwindled to the vanishing point, and mental peace reigned.

Then the office procedure was studied, with an eye to developing organization and greater efficiency. This was found:

Inaccurate and inadequate records were kept. No standard filing system was maintained. Customers' orders were not recorded and filled in the order they were received. At least 50% of the bookkeeper's time was wasted in correcting errors. Inaccurate cost-of-manufacturing records resulted in a financial loss to the company. And administrative costs were completely forgotten.

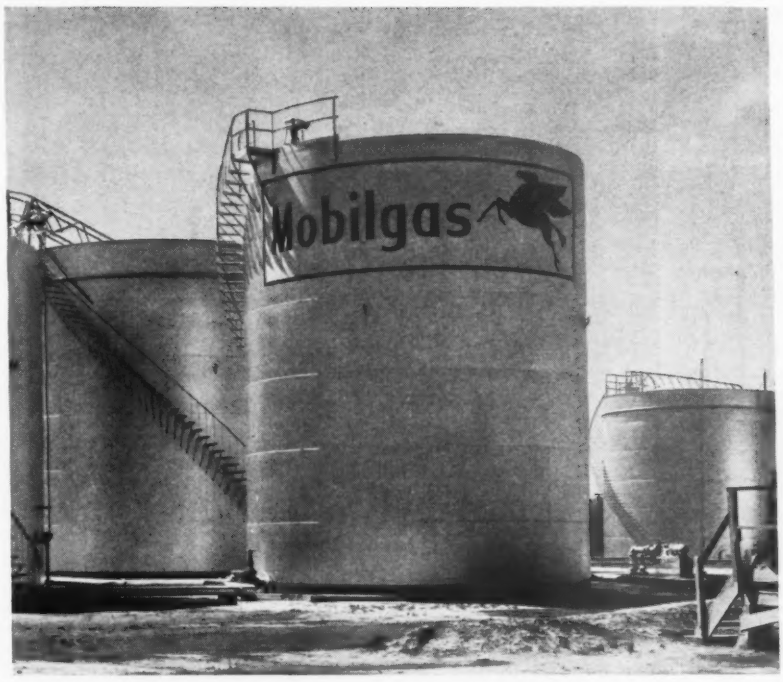
One by one, these discrepancies were corrected and the office routine was put on a "paying basis."

Distributors Educated

Next, the purchasing system was revised to (1) take advantage of quantity prices and (2) create competitive bids for raw material orders.

Before installing a new purchasing method, the former general manager had favored certain companies, regardless of price. He was not interested in competitive prices. After the new system was installed, bids were secured for all purchases, and orders placed accordingly.

Trouble was taken to familiarize the firm's distributors with techniques



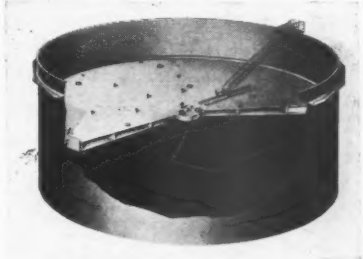
They're protecting the zip in the "flying red horse"

To the Western motorist, the name and symbol shown above are a familiar and welcome sight. Familiar because he sees them at the service stations of the General Petroleum Corporation. Welcome because he knows they stand for high-quality gasoline.

It's the light fractions in Mobilgas that are responsible for its easy starting. They also contribute to its anti-knock properties. These fractions, however, are volatile and escape readily from fixed-roof tanks. General Petroleum didn't want that to happen at its new sub-terminal at Sacramento, Calif. So it equipped each gasoline storage tank there with a Horton Double-Deck Floating Roof. Some of these tanks are shown above.

How does the Horton Double-Deck Roof prevent excessive loss of light fractions? First, **as the drawing below shows, it floats directly on the liquid. This reduces evaporation losses for there is no air-vapor mixture under the roof to be vented. *Second,* the double-deck construction provides insulation that cuts down boiling losses. *Third,* the Horton Seal doesn't let vapor escape around the edge of the deck.**

Write for Bulletin B for details about the Horton Double-Deck Floating Roof.



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Chicago 4	2132 McCormick Building	Salt Lake City 4	568 West 17th South Street
Cleveland 15	2256 Guildhall Building	San Francisco 4	1578—200 Bush Street
Detroit 26	1567 Lafayette Building	Seattle 1	1369 Henry Building
Havana	402 Abreu Building	Tulsa 3	1667 Hunt Building
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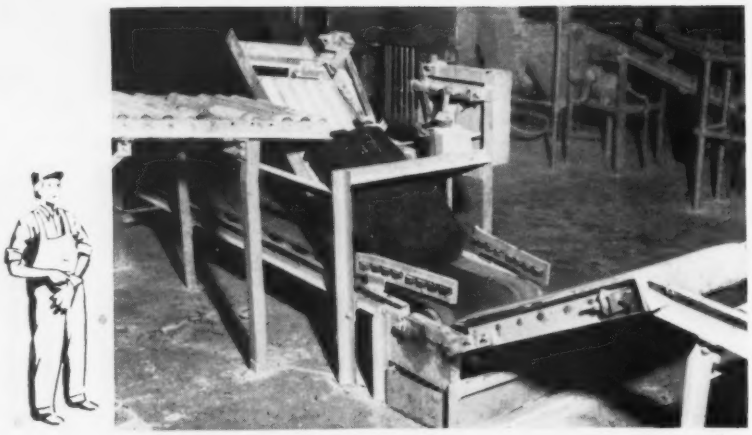


mechanized handling benefits everyone

● In every industry today, the advantages of mechanization are far-reaching. The production of more and better things, at less cost, which is made possible by modern production equipment, benefits employees, management, shareholders or owners, and purchasers of the product. The application of this modern equipment, and the efficiency and economy which it creates, is bringing more good things within the reach of more people.

Well-planned conveyer systems play an important part in these mechanization programs. Today Mathews Engineers are making available to our expanding Western Industry the benefit of long experience with conveying problems. This, and the facilities of a modern Western Plant are yours for the asking. Engineering offices or sales agencies are located in principal Western Cities.

●

MATHEWS CONVEYER COMPANY WEST COAST

SAN CARLOS, CALIFORNIA

Engineering Offices or Sales Agencies in Principal Western Cities

of maintenance, and to orient them on performing genuine service to customers.

Up to that point, they had been given no training in performing minor repairs on tackers for their customers. When trouble cropped up with a machine, regardless of what it was, the tackers were returned to the factory. Postal charges to the factory were borne by the distributor; transportation back to the customer was paid by the factory.

Visual aids and other manner of informative publications were issued to the distributors, who immediately became better informed about what they were selling.

Cost of printing visual aids, illustrating the tacker assembly, showing disassembly of tackers, performing minor repairs, etc., actually amounted to less than the cost of postal charges one way on returned tackers for one month.

Distributors, recognizing immediate benefits to themselves, established maintenance service on a local basis. Spare parts, furnished free of charge to them, are now kept in stock for use at a minute's notice.

Far-Reaching Results

Here are three far-reaching results of that seemingly-simple operation:

1. Customers now receive prompt service on-the-spot.

2. Factory employees, who were formerly occupied with repair work, are now being employed in productive effort in the plant.

3. Maintenance costs, both in postal charges and in labor, have been slashed by 75%.

Inactive and disinterested distributors who just "carried the line" were discontinued and new ones were appointed.

Back in the plant, work hours of productive machines were stepped up from eight hours per day to 24 hours per day. The backlog of orders gradually disappeared, and since then (1) customers have enjoyed considerably better service, and (2) the production machines have been fully utilized.

Packaging Systematized

Packaging presented problems, too. But that system was soon streamlined to afford a more economical packaged product at a distinct reduction in cost.

Duplication in printed labels was eliminated. Individual boxes contained labels, and the cartons in which they were shipped contained labels also. A printed stamp was substituted for the label on the outside carton.

Individual boxes inside the cartons were then eliminated. One packing

case holds four cartons; each carton used to hold 16 individual boxes of staples. By eliminating the 64 small boxes in each carton, a saving of 32 cents per case was realized.

All the while this activity and study was going on in the plant and with the firm's distributors, a progressive

Old plant (upper picture) was soon outgrown and replaced by larger establishment (below) as result of systematic plan for operating.

trend of thought was initiated among the employees to incorporate constructive ideas and stimulate suggestions. Personnel were encouraged to believe that they "belonged," and that they were just as necessary to the company as the company was to them. A sense of mutual benefit and appreciation became evident. A definite feeling of security and confidence exists and keeps on growing.

Repairs on production machinery were necessary at times, and the former general manager had always closed the factory to perform those repairs and laid off the personnel during the process. Repairs are now performed on a scheduled basis, working on one machine at a time, and there is no such thing as unemployment at Calwire any more.

Accurate Records, Cheaper

Raises are given to employees depending upon the ability and progress of each as an individual. Inventions are rewarded by a bonus plan. Everyone is encouraged to contribute mental attitude as much as physical labor. And employees are continually enlightened as to their importance to the organization's teamwork.

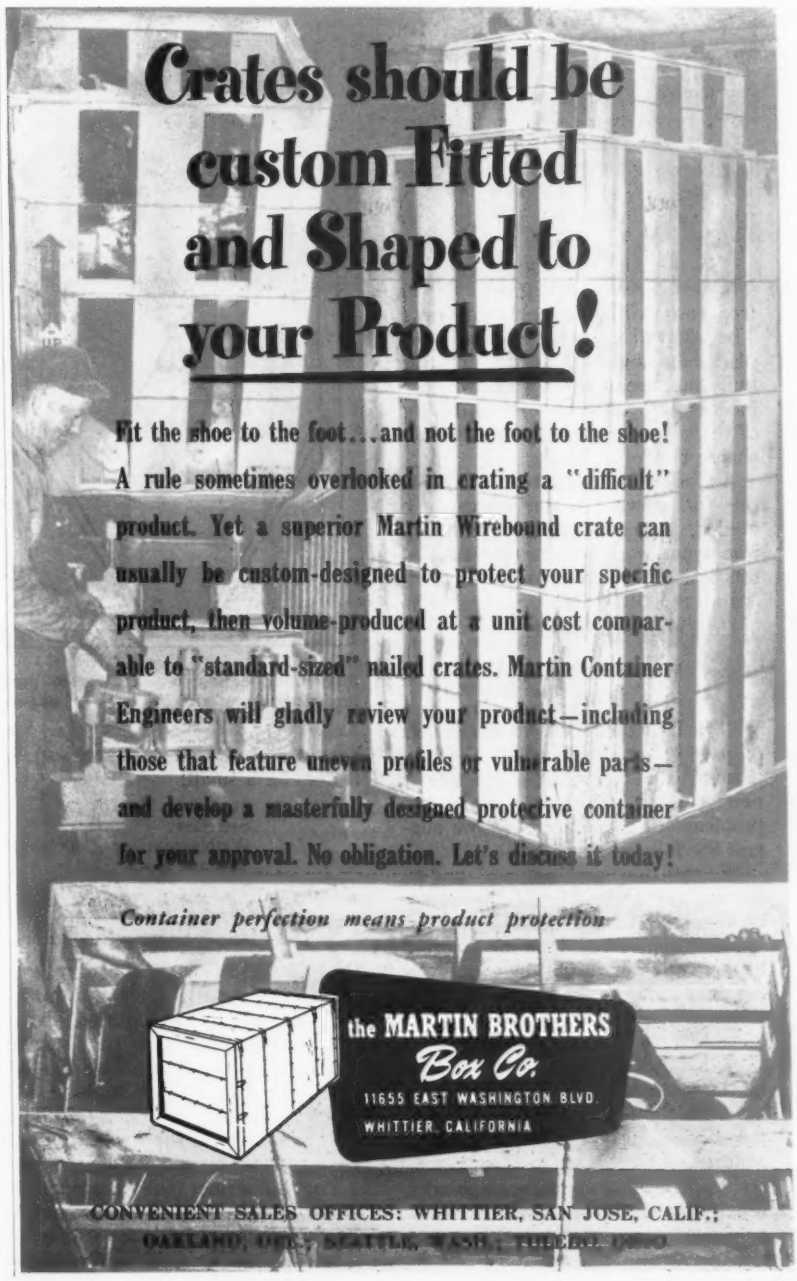
Today, accurate records are being maintained with top clerical efficiency and with less personnel than was employed during the firm's first year of operation. Accurate cost and statistical charts are maintained. Cost of production has been drastically reduced. Now the company is paying a profit on these innovations, which can all be summed up in two words—organization and cooperation.

New quarters were purchased in January of this year. The company is now in the new location, 328 North East Third St., Visalia, where there is 60% more available space than existed in the rented building where they started.

Boost for Small Business

A special section of the National Production Authority, called the Pooling Section of the Office of Small Business, has been set up in Washington to assist small business production pools.

Wendell O. Metcalf has been named Chief of the Section. According to him, the Pooling Section is currently in consultation with the Department of Justice to get clearance for the use of pools under the Defense Production Act of 1950.


Crates should be custom Fitted and Shaped to your Product!
Fit the shoe to the foot...and not the foot to the shoe! A rule sometimes overlooked in crating a "difficult" product. Yet a superior Martin Wirebound crate can usually be custom-designed to protect your specific product, then volume-produced at a unit cost comparable to "standard-sized" nailed crates. Martin Container Engineers will gladly review your product—including those that feature uneven profiles or vulnerable parts—and develop a masterfully designed protective container for your approval. No obligation. Let's discuss it today!
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FIVE ANSWERS FOR READER'S PROBLEM

"Tunneling out" of wood waste in small bin storage troubles "Western Industry" reader. Five others pitch in with help.

FIVE DIFFERENT ANSWERS have been received to date from readers of *Western Industry* to the problem presented in the February issue by a woodworking plant which is having trouble with small bin storage.

This plant is constructing a bin with a V-bottom of 45 degrees, sloping from each side into a central conveyor. The bin will store a combination of planer shavings and sawdust, a rather fluffy mixture of wood waste which is inclined to "tunnel out" over the top of the conveyor and decrease the discharge flow of the fuel.

A mechanical arrangement to break this fuel down into the conveyor is needed, but a regular bin vibrator would not work because the floor of the bin is too heavy to shake or vibrate.

Here are the answers:

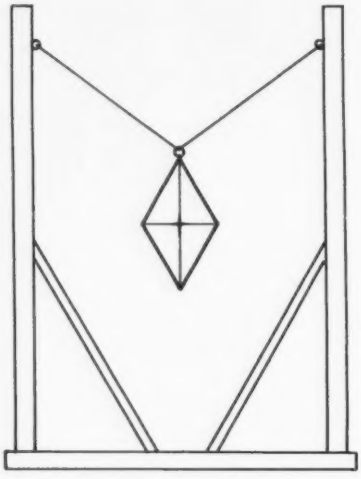
Solution No. 1: Suspend Cones in the Bin

WITH REFERENCE to the article on page 48 of your February issue regarding a correspondent building a new fuel bin and worried about the problem of "tunneling out," we suggest the following as a solution.

We call this "arching over" and to destroy any arch, it is only necessary to disturb the keystone.

Small hopper-fed domestic sawdust burners are used in this area for home heating, and the problem of arching is solved by suspending a hollow sheet-metal body at what is roughly the keystone point of the arch usually formed in the material. These usually take the form of two pyramids or cones joined base to base and loosely suspended so that they can move laterally, depending upon the unbalance usually prevailing in the arch and this movement serves to dislodge the material.

You will note herewith a very rough sketch of this idea, which I think



Suspended cones joined base to base to dislodge material if "arching" occurs.

should work as well on a large scale as it does on a small.

JOSEPH H. MANLEY
Secretary,
Washington Door Company,
Tacoma, Wash.

* * *

Solution No. 2: Use Bin Excavator

IN PERUSING your February issue we became greatly interested in the little boxed article entitled "How Would You Do It" on page 48. As answer to your question we are enclosing a copy of our bulletin 101 which was published in 1928. This copy is somewhat shelf worn, but we are sure that you will consider its age.

Your subscriber really has no problem at all because we have two outfits that have been running for at least 25 years, and which do this work without any trouble at all. If you could wire your men to forget the hopper bottom in his bin and install an outfit such as is shown in this bulletin, we are sure that you would be doing him a tremendous favor.

As a matter of fact the bins at the old Pacific Door & Sash Company job were 20-ft. x 40-ft. floor area and 40 ft. deep. This, of course, stands almost exactly with the size bin which your subscriber mentions. At the Pacific Door job the shavings were mostly from kiln dried lumber, but at the San Pedro Lumber Company some of the shavings were wet and were packed so solidly that it was no trouble to dig a tunnel 6 ft. in diameter without supports.

We believe that if you will forward the enclosed bulletin to your subscriber that he will find it of great interest.

W. E. SAXE
President-Chief Engineer
The Conveyor Company
Los Angeles, Calif.

* * *

Solution No. 3: Use Air Jets

IN REGARD to the "Engineer Teaser" mentioned in your February issue, the writer has given the problem of "the tunneling sawdust" some thought and offers the following as a possible solution to the problem.

Installation: Air jets placed in rows along the length of the bin at approximately 18-in. intervals; the rows to start slightly above the conveyor and be spaced every 18 in., one above the other. Each jet staggered so as not to be in line with the one above. Each row to be individually operated by a valve. Nozzles to be mounted flush with inside of bin.

Operation: When the sawdust mixture begins to "tunnel out" the operator opens the valve controlling the lowest row of jets. After a short blast the valve is closed and the next higher valve opened. This procedure is repeated until the jam is broken.

Notes: Air should be supplied from

Do you need help on your problem too?

Five different readers of *Western Industry* took the time and effort to submit solutions to a problem that was bothering another of our readers. Have you a mechanical difficulty on which you would like help from others? Send in your problem to the editors of *Western* Industry and see if we can get you some good information that will save you money and eliminate some troublesome situation.

large high pressure tanks. Exact lbs./sq. in. to be computed. Piping, valves and header arrangement should be closely engineered with regard to line pressure drop, to insure even pressure throughout the system.

Careful consideration should be given to the nozzle design and orifice size to yield the best results while using the least amount of air. I hope this solution may be of help to the manufacturer you mention and if any further information is desired, please do not hesitate to communicate. Incidentally, when an acceptable solution is found, I would like very much to know the nature of same.

WINFIELD S. KEMPER
Associate Engineer
Management Engineering
Associates, Inc.
Sacramento, Calif.

* * *

Solution No. 4: Rig Paddles or Strap on a Shaft

IN ANSWER to your problem (in the February issue) in regard to the planer shavings and sawdust bin.

I had a similar problem with a cement bin (shaped the same, only smaller). The bin was under considerable vibration, which packed the cement at the mouth of the tube; where the hopper tapered down, the tube would empty out, leaving 50 sacks of cement packed in the hopper.

I overcame this by putting a shaft (motor-driven) with two pieces of strap iron bolted to the shaft. In turning, the strap iron kicked the cement loose and allowed it to flow evenly.

In your case, place a shaft through the long way of the bin, with a strap or paddles a foot or two apart. These paddles can be long if placed far enough up in the hopper so as not to hit the bottom.

I feel this will keep the sawdust loose.

PAUL WENDLING
Stockton, Calif.

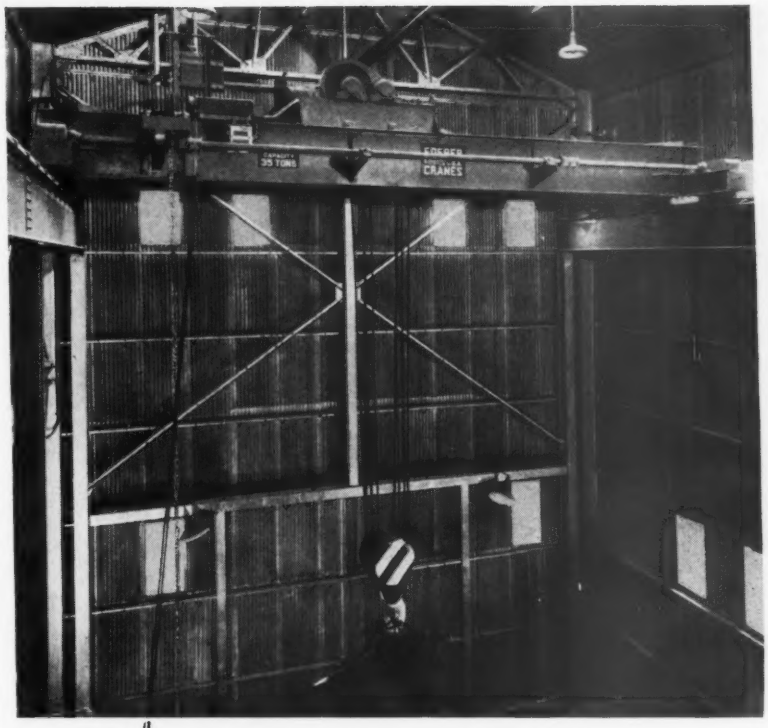
* * *

Solution No. 5: Use Balloons

THE ENGINEER teaser on page 48 of the February issue put me to thinking. Try this on for size.

Have the mill install large balloons on inside of bin. When deflated they will not take up much space and will not be subject to wear as material not too abrasive. When inflated they will push shavings, etc., toward center and fill up "tunnel." Not being a technical person, I can't go into detail, but a little air should do the job cheaply and quickly.

JOHN W. COFFMAN
Consumers Oil Company
Los Angeles, Calif.



ANOTHER EDERER CRANE AT WORK

HANDLING WESTERN MATERIALS

Western industry — from steel mills to pulp and paper plants — moves materials with EDERER cranes. In a typical installation, shown here, EDERER engineers custom-built this 35-ton standby crane to the exact job requirements of the plant.

It is this custom-building ability — plus plant capacity — that has made EDERER one of the largest crane manufacturers on the Pacific Coast, with "know-how" and facilities to build any type of crane for any industry. Why not discuss your special job requirements with an EDERER engineer?

A note on your letterhead will bring you our Crane Bulletin C-308

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Kenosha, Wisconsin

Uranium Can Be Extracted From Phosphates

A PROCESS has been developed by the Atomic Energy Commission whereby uranium in phosphates can be extracted economically in the production of highly refined fertilizer known as triple superphosphate.

In the production of triple superphosphate, phosphoric acid is produced at one stage. In the production chain, between the phosphoric acid stage and the final stage, it appears to be feasible with the new process to extract uranium from the phosphate by attaching special equipment to the facilities used in the production of the fertilizer.

It has been well known for some time that uranium occurs as a very minor component in phosphate deposits in the northwest and in Florida. Considerable research work has been done to develop a process whereby uranium can be extracted economically from these very low grade sources. It is hoped that the new process will open up this new source of uranium. The process is classified and cannot be described.

Jesse Johnson, Manager of AEC Raw Materials Operations, points out that in the production of phosphoric acid, sulfuric acid is used. For this reason, sulfuric acid available to industry for the production of fertilizer also assists the Commission's program for extracting uranium from phosphates as a byproduct of fertilizer production.

Applying S. Q. C. to Frozen Foods Packing

STATISTICAL quality control can be applied in frozen foods packing to considerable advantage, according to T. W. Utterback, manager of the research and quality control division of Pictsweet Foods, Inc., Mt. Vernon, Washington.

In the high speed filling of retail packages, it is possible through a series of tests to determine the maximum fill efficiency of each particular filler for each of the various products which it handles, he points out.

For example, Pictsweet determined that in filling peas with one particular type of frozen foods filler, the equipment was capable of delivering a fill range of a certain known variation. Consequently a weight chart is maintained near the filler, with these control limits drawn in. Every time the packages are weighed, at specified intervals, the weights are plotted on the chart, thus giving the filling operator a running graphic picture of what

the filler is actually delivering to the package.

Not only do overweights and underweights become instantly apparent, but what is more important, a trend toward over or underweight is instantly recognizable and the filler adjustment can be made before valuable food product is lost through overfill, or before the inherent dangers of underfill materialize.

Blue Cross Service Adapted to Western Needs

ALONG the West Coast this month, Blue Cross Plans made another forward step for the benfit of employees of companies with Western headquarters.

Traditionally the voluntary prepaid health Plans have been proud of their localized nature. They consider it one of their strongest points that each of the 90 Blue Cross organizations in the country reflects the needs of its own community. As a result, from region to region Blue Cross rates and benefits vary in accordance with varying hospital and medical costs and procedures.

In a new program just announced by Blue Cross organizations in Washington, Oregon, California and Idaho, each Plan retains its traditional community basis for local members. At the same time it offers to widely scattered groups of employees of Western companies a program which ignores state boundaries, yet gives uniform protection up and down the coast. This regional plan provides 70 days of hospital care for each confinement, and includes a choice of comprehensive programs of surgical-medical benefits.

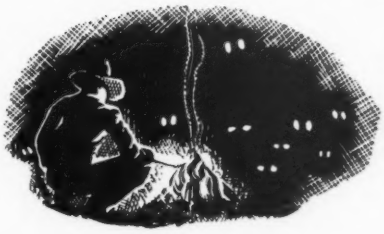
It follows the pattern of recent nation-wide Blue Cross programs which offers uniformly packaged protection to the employees and their dependents of such widely scattered concerns as U. S. Steel and General Motors.

Local Plans remain unchanged, with a wide choice in hospital and surgical-medical protection.

Blue Cross service contract provides the necessary flexibility to handle the normal as well as the abnormal case. Contracts with member hospitals provide for hospital admissions of the subscriber and dependents without cash deposit. The bill for services rendered is sent direct to Blue Cross. The Plan pays the hospital direct for their bill and mails a check for the surgical or medical benefits to the subscriber at his home.

There are no claims to file by the employee or his company. Simplicity of operation is the key-note, with maximum benefits at minimum cost.

Guard Against Intruders

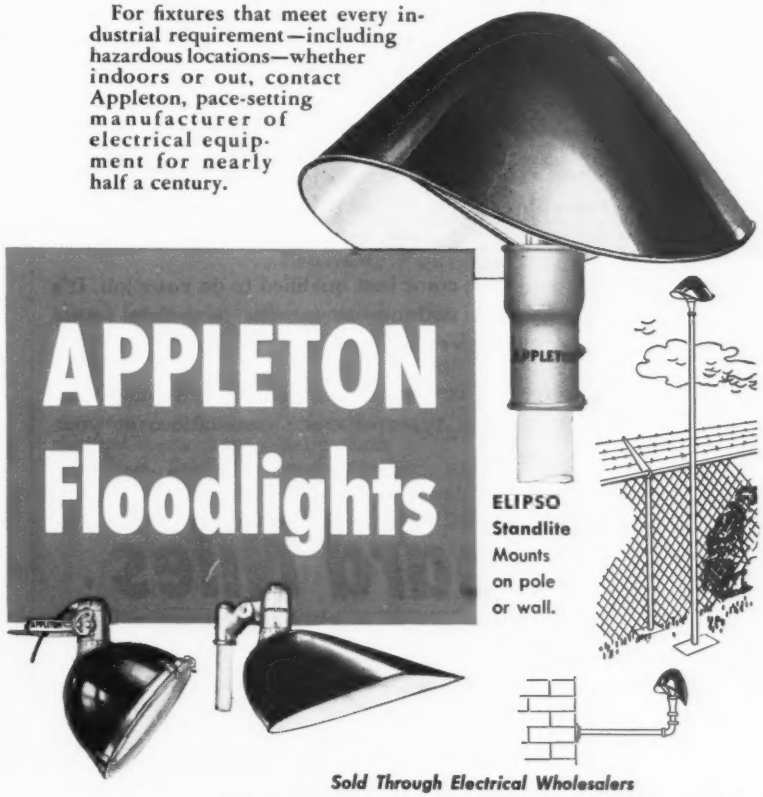


WITH GOOD LIGHT

Alone in the wilderness, a man relies on the light of his tiny campfire to hold night-prowling marauders at bay. You can give your plant and personnel this same time-tested protection with Appleton Floodlights—big, rugged fixtures expressly designed to guard industrial properties while providing the good light necessary for best working conditions.

For example a series of Appleton Elipso Standlites—properly spaced along a fence-line or mounted on buildings—forms a veritable barrier of light. This is only one of the many expertly designed fixture models from the complete Appleton Floodlight line—a line that includes a sound, scientific answer to every known floodlighting problem.

For fixtures that meet every industrial requirement—including hazardous locations—whether indoors or out, contact Appleton, pace-setting manufacturer of electrical equipment for nearly half a century.



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Use Dependable
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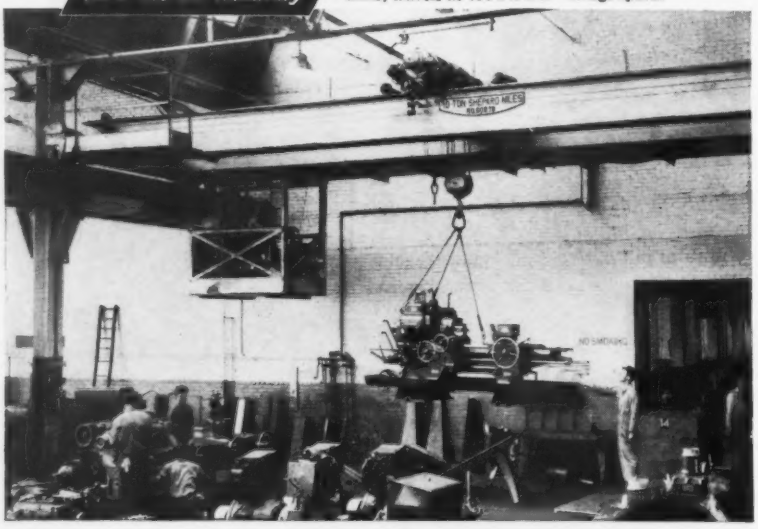
For this installation, operating conditions called for rapid travel over a large area. Controlled by operator in the cab, this Shepard Niles 10-ton, welded-beam crane, with main and auxiliary hoist units, travels at 450 F.P.M.—bridge speed.



we start by asking "what"

WHAT are *your* problems? Under WHAT conditions will *your* crane be operated—intermittently, or under fairly constant conditions? WHAT are the operating speeds necessary to meet *your* productive cycle?

Your answer to these and similar questions will enable us to engineer your installation so that it will give you the best, and longest service—at the lowest cost per load over the years.

Be sure you get the crane best qualified to do *your* job. It's wise—and costs you nothing—to get the facts first, rather than to make expensive changes later.

May we place our experience of a great many years of successfully designing all types of crane installations at your disposal?

Shepard Niles

CRANE & HOIST CORPORATION

Main Office & Works, 469 Schuyler Avenue • Montour Falls, N. Y.

For WESTERN CUSTOMERS

For your greater convenience, we suggest that inquiries be directed to the Shephard Niles representative listed below, located nearest you.

LOS ANGELES: CRANE & HOIST ENGINEERING CORPORATION
6238 Maywood Avenue, Bell, Los Angeles, California—Mr. Chester M. Mason

SAN FRANCISCO: STRYCO MANUFACTURING COMPANY
470 Natoma Street, San Francisco 3, California—Mr. R. C. Arquette

SEATTLE: PRESTON FALLER COMPANY
1921 Minor Avenue, Seattle 1, Washington—Mr. Preston Faller

Revolving Floor Tests Wheels and Casters

TO TEST the operating conditions faced by industrial wheels and casters, Aerol, Inc., of Burbank, Calif., are employing a large drum revolving at variable speeds beneath superstructure devices which test three articles concurrently.

This permits a wide variety of tests on wheels up to 20 inches in diameter with applied loads ranging up to 2,500 lb. at speeds variable from 1½ to 25 mph. The rotating drum, which simulates the surface over which wheels roll in actual use, possesses inertia equal to, or greater than, that which would be present in vehicles on which wheels are mounted.

Realistic shock loads are thus applied during tests to simulate rough surface conditions.

To simulate abnormal surface and performance problems encountered in some industrial plants, a variety of auxiliary "bumps" may be bolted onto the revolving cylinder for analysis of wheel reaction under all conditions. Surface coatings applied to the cylinder surface permit study of wheel tread materials intended for use in plants where acids, fats, and corrosion factors are common. A built-in intervalometer permits stop and go tests under all load and surface conditions.

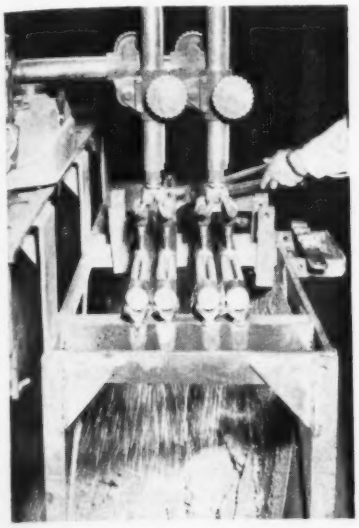
Rotating drum simulates any surface over which wheels roll in actual use.

Although the Aerol test stand is primarily intended for test of wheel and tread materials, the three test booms are sufficiently flexible to permit special breakdown studies on bearings and seals.

With deliberate breakdown a prime element in many wheel tests conducted on the new stand, an automatic shut-off is incorporated into the electrical system to stop the test drum and record the time of shut-off whenever a wheel disc, tread or bearing fails.

Flame-cutting Turnbuckles On a Production Basis

MARINE IRON WORKS of Tacoma, Washington, is using oxy-acetylene cutting to rough out turnbuckles from blank bars on a production basis. The cut bars are then heated in a furnace,



Operator unloads four cut bars from jig used to make turnbuckles as four more bars are being cut. Process is repeated so cutting is a continuous operation.

spread apart by wedge-shaped dies, and threaded for eye bolts.

Cutting is automatically done with two Oxweld C-56 blowpipes mounted on an Oxweld CM-30 cutting machine. Each blowpipe is equipped with a two-nozzle adaptor so that four cuts are made simultaneously.

A special jig, which holds eight lengths of 1½ in. round bar, is used for the cutting. The 22-in. lengths are set in the jig in two rows of four bars. The first four bars are cut, then while the second group is being cut the operator unloads and loads the other half of the jig. Then the process is repeated so the cutting is a continuous operation. Cutting time for eight bars, including down time for flame adjustment and nozzle cleaning, is only five minutes.

Course in S. Q. C. At University of Colorado

THE COLLEGE of Engineering at the University of Colorado at Boulder will conduct an intensive training course in Statistical Quality Control from June 19-29. The course will include acceptance sampling and other industrial statistical methods used in industry. John F. Wagner, Assistant Professor of Applied Mathematics, will be in charge and instructors will be men who have had experience both in the teaching of this technique and in its application in industry and business.

Training New Management In Los Angeles

ACTING on the premise that the supervisor will only train others as well as he is trained himself, the Merchants and Manufacturers Association of Los Angeles has instituted a management development program directed by its Supervisory Activities Committee.

A series of monthly institutes got under way in February, with from 150 to 200 companies represented by top or middle management. As each person attending the institute in turn trains 10 to 20 men in his own company, the M & M expects that probably 4,000 people will receive the benefit of the program.

By this means it is hoped to meet in some measure the supervisory training problem arising in the community from military contract activities, the skimming off of trained men into the armed services and the generally continuing need at all times for a better understanding of management methods.

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NEW MATERIALS & EQUIPMENT

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Use postage-paid card following page 66 to obtain further information on products described on these pages and literature listed on following pages . . .

E-401

The Lamp of 1001 Angles

Features claimed: A working lamp built to give completely satisfactory lighting without shadows or glare for almost any job. Easily raises, lowers, tilts or turns to any position, any angle, and then stays put. Can be moved

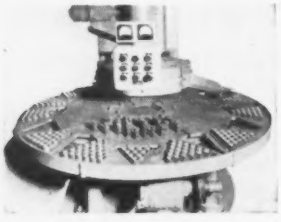
from job to job or permanently installed on desk, drafting board, lathe, work bench or table. Soft strong light concentrated on needed spot; location, direction and intensity of light can be instantly changed, but requires only 40-60 watt bulb. Available in ivory, grey, green, biege and black baked enamel finish, with head lamp range of 41 inches.

Available from: Andreassen & Co., Inc.

E-402

Coil Springs Ground More Rapidly

Features claimed: This grinder offers rapid grinding of coil springs with accuracy and quality. It has extra flexibility, saves time in operation, increases the wheel life and saves floor space. The machine grinds springs from ½ in. to 6 in. long, from ¼ in. to 4 in. in diameter, and from .0625 in. to .500 in. wire diameter. The abrasives are constructed to grind a variety of spring types as well as materials such as oil tempered steel, music wire, bronze wire, etc. This eliminates down time for wheel change-over.



Available from: Charles H. Besly and Company.

E-403

Bulletin Boards Go Irish

Features claimed: Litegreen is the new colored bulletin board deemed easier on the eyes. It is made of cork composition ⅛-in. thick, bonded to ⅜-in. fiber board backing. Because of this rigidity it can be nailed to studding or mounted over rough masonry walls with no fear of the cracking found in the old fabric backed linoleum types of bulletin board material. It is available in sheets 4 ft. wide to 12 ft. long, and in made-up portable bulletins.

Available from: Beckley Cardy Co.

E-404

Gaskets Get Blue

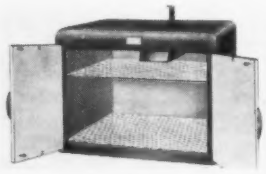
Features claimed: Flexitallic "blue" is a new product identification for asbestos-filled gaskets made by the company. Blue-dyed asbestos will be used between the V-crimped metal plies in metal-asbestos gaskets. All-metal gaskets and gaskets using other types of filler will not carry the color identification. The product-identification program began last year with the stamping of the name Flexitallic in the metal spiral of each gasket.

Available from: Flexitallic Gasket Company.

E-405

Take the Oven Out On the Job

Features claimed: A portable industrial oven capable of heating to 225 deg. in 15 minutes is available for $79.50. The oven can be used for baking enamels, lacquer, wrinkles and other finishes; for dehydrating bobbins, coil forms, paper tubing; for drying plastic granules, parts after cleansing; and for preheating molds. Outstanding features include uniform temperature throughout, and an adjustable damper giving wide range of constant temperature. The oven is 29 in. wide, 24 in. deep, and 20½ in. high inside. Other models are available.



Manufacturer: Grieve-Hendry Co.

E-406

Special Adhesive for Woodworking Industry

Features claimed: Stix adhesive hopes to take over for Polyvinyl Acetate, which is in short supply. Better waterproof qualities and higher resistance to shock are characteristics of the new product which will adhere wood to rubber, plastic, metal and other surfaces. Many woodworking operations will no longer require the use of clamps if this new adhesive material is applied.

Available from: Adhesive Products Corporation.

E-407

Explosion-Proof Floor Maintenance

Features claimed: The Explosion-Proof Commander floor machine is vapor proof, spark proof, and shock proof and custom built under safety regulations. All wiring, electrical apparatus, etc., is tested and sealed, so that flames and sparks cannot escape to set fire to gas, dust or fumes in industrial plants. It can be used for sanding, waxing, polishing, scrubbing, wire-brushing and steel-wooling.

Available from: Holt Manufacturing Company.

E-408

Balanced Relay for Electronic Applications

Features claimed: This sub-miniature dynamically balanced relay for weight-critical electronic applications weighs less than 1/3 oz. It is especially designed to meet requirements for aircraft and missile installations. It has

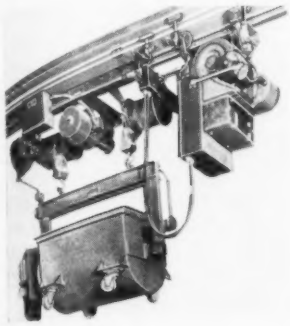
high resistance to vibration and shock and sudden changes in acceleration and direction. It is a single pole, double throw 28-volt DC relay with contacts rated at one ampere non-inductive load.

Available from: Hufco Industries.

E-409

Fast Freight for Foundries

Features claimed: This carrier was originally designed to deliver core sand to storage hoppers at core makers benches and core blowing machines. It consists of a standard MonoTractor for horizontal propulsion on the MonoRail tracks, a twin hook electro lift hoist, and a special bucket mounted so that the gear head motor can turn the bucket one complete revolution. This carrier is also equipped with control devices to perform selective stopping and starting at any point desired on the track.

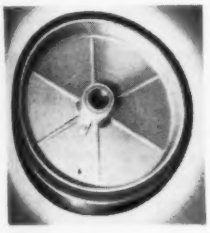


Available from: American MonoRail Co.

E-410

Sealed-Hub Industrial Wheel at Half Price

Features claimed: Airlite Seal wheel, made of cast aluminum with solid rubber tread, is now available at a price 50% below sealed-hub units now on the market. Because this new wheel excludes virtually all foreign matter responsible for excessive bearing and axle wear and deterioration, it is especially suitable for foundries, metal and woodworking shops, mills, warehouses, meat packing and other industrial plants. It is currently available from 6 in. to 20 in. diameter.

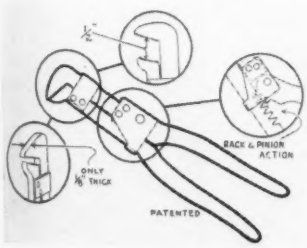


Manufacturer: Aerol Co., Inc.

E-411

Power-Grip Wrench

Features claimed: Incorporates a rack-and-pinion action with angle head, and affords extreme pressure application in ordinarily inaccessible spots. Head thickness is only 1/8"; overall length is 5¼". Made of fine alloy steel, and guaranteed unbreakable. Finish is non-glare black, with polished straps. Price, $1.50.



Available from: Colman Tool & Machine Co.

E-412

Tank-Type Cleaner Inhales, Exhales

Features claimed: The operator of this industrial machine has a vacuum cleaner, water pick-up and powerful hand-type cleaner or blower all in one. Dirt, dust and metal particles from all types of floors are easy prey for

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New, Modern, RACINE Metal Cutting Machines step up your entire production. They save material — reduce cut-off time and lessen subsequent machining operation because they are so extremely accurate.
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Oakite's New FREE Booklet on Paint Stripping

WHAT'S THE BEST WAY TO STRIP PAINT FROM METAL PARTS TOO LARGE TO BE SOAKED IN TANKS?
See Page 3

answers many questions that will lead you to better stripping procedures. You'll want to read more about:

What's the best way to strip large areas of structural metal where a steam supply is available? *See page 5.*

What's best when steam is not available? *See page 7.*

What is the cheapest way to strip metal parts in large volume? *See page 9.*

What are the best ways to prepare stripped surfaces for repainting? *See page 11.*

What strippers are best for removing oil-base paints? . . . Synthetic enamels, alkali-resistant plastics or resin-based paints? . . . Japans, wrinkle finishes, nitrocellulose lacquers, alkyds, phenolics and ureas? *See page 12.*

FREE For a copy of "How to STRIP PAINT" write Oakite Products, Inc., 1001 E. First St., Los Angeles, or 681 Market St., San Francisco, Calif.

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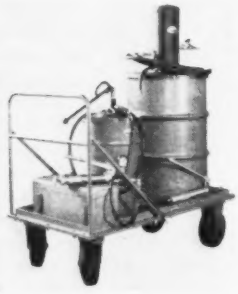
the cleaner, and it quickly removes water from floors after mopping. The super-suction is valuable for scrap collection and cleaning stock shelves. The blower feature is good for difficult cleaning in hard-to-get spots, and the sprayer attachment gets smooth results with paint, lacquer, etc.

Available from: Ideal Industries, Inc.

E-413

Reloads Bearings and Grease Reservoirs

Features claimed: Lubrikit, for reloading individual bearings and centralized lubricating systems on industrial machinery, consists of a 400-lb. grease drum for the filling of grease reservoirs. It has a hand transfer pump on a 100-lb. drum for delivery of oil, a tool box containing fittings, hand guns and hand tools for servicing the individual bearings and is mounted on a steel base 30 in. by 60 in., and 10-in. diameter rubber casters, two solid and two swivel for easy maneuverability through factory aisles.



Available from: J. N. Fauver Company, Inc.

E-414

Automatic Unloading Attachment Introduced

Features claimed: This attachment supplies the need for a standard unit to convert shaving machines for automatic unloading of small gears when automatic loading is employed. It consists of a small wire-mesh belt which travels over two drums. Drive is from a low-horsepower

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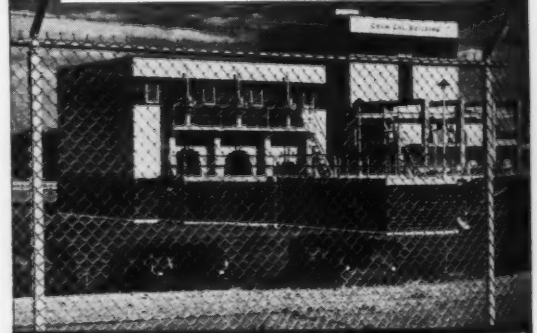
For complete details refer to Sweet's Catalog. For free estimate consult your classified telephone directory—or write direct.



REALOCK FENCE CF&I

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THE COLORADO FUEL & IRON CORP. Continental Oil Bldg., Denver 2, Col.
THE CALIFORNIA WIRE CLOTH CORP. 1080 - 19th Avenue, Oakland 6, California
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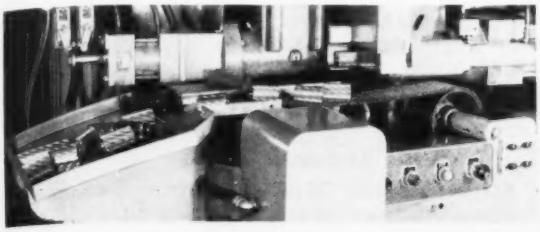
electric motor and slots in one mounting bracket allow adjustments to take up slack in the belt. Low constant speed permits cutting fluids to drain back into the machine



before the gear is discharged into the collecting pan, and the belt has a certain amount of give which prevents damage to the finished gear.

Available from: Michigan Tool Company.

E-415

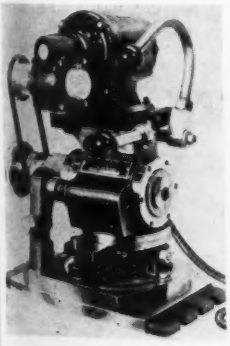
Precision Counter for Conveyor Lines

Features claimed: This counter records every unit regardless of how tightly the packages move along the conveyor line. The instrument fits between sections of gravity, belt, or live roller conveyors. A short, powered belt carries the package forward to the barrier and contact causes an air-cylinder to raise the front of the package. The belt then propels the package over the barrier and deposits it on the live roller discharge unit while the numbering machine registers the count. The barrier resets itself to receive the next package. Positive stop eliminates accidental release and assures accuracy of count. Capacity is approximately 40 packages per minute. The machine is a self-contained unit.

Available from: Alvey Conveyor Manufacturing Co.

E-416

New D-S Radial Relief Grinder



Features claimed: This new model has a stepless speed control, achieved with a selenium rectifier which makes possible speeds from 0 to 80 rpm's by simply turning the dial knob. The motor is 110-volt DC. The fixture can be used with a number of standard tool grinders.

Available from: Royal Oak Tool and Machine Company.

E-417

Glare Slain by Safety Glasses

Features claimed: All visible light rays are toned down evenly by these new absorptive safety glasses for people with especially sensitive eyes. Wearer's appearance was

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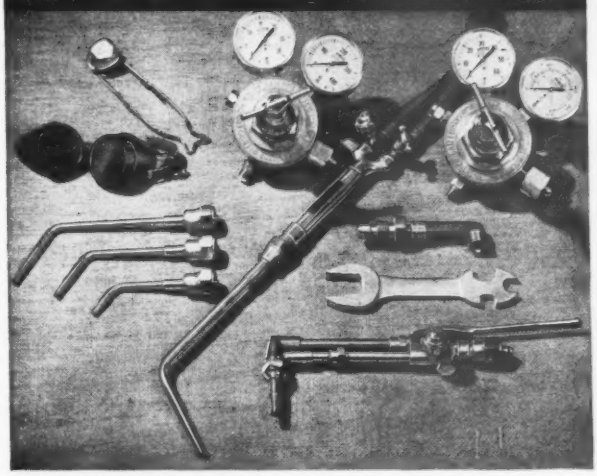
BASIC WELDING & CUTTING UNITS



The flexibility and wide range of Unit WC-25, shown here, enable you to do all usual welding and cutting operations, either in production or maintenance work. For special jobs such as hard-facing, multi-flame heating, deseaming, brazing, descaling, you simply add suitable tip, nozzle or attachment.

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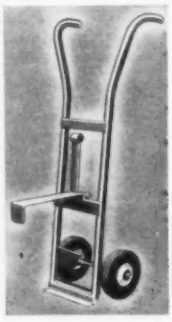
also considered by the manufacturer and these glasses are designed for dress as well as safety wear. Lenses are flesh-colored, can be readily hardened to meet and surpass requirements for safety by U. S. Bureau of Standards and retain the neutral absorption properties and transmission qualities of standard Soft-Lite lenses.

Available from: Bausch & Lomb Optical Company for Soft-Lite Lens Company.

E-418

This Truck Is A Backsaver

Features claimed: Designed principally to handle the new style cardboard "kegs" used for shipping small parts, such as bolts, washers, etc. Such a shipping container, filled, weighs up to 300 pounds (12″ x 12″ x 18″). With this new two-wheel hand truck, one man can pick up the container, roll it away, put it on a pallet or skid, without even touching the container with his hands. Truck has a short nose blade, and a hinged hook arm to hold the container on the truck. Truck frame is ¾″ pipe; wheels are rubber tired with roller bearings.



Available from: Thomas Truck & Caster Co.

E-419

Stroboscopic Tachometer

Features claimed: Portable unit with flashing range of 600 to 14,400 per minute. Speeds can be read directly from a dial calibrated in rpm. By using multiples of the flashing speed, measurement range can be extended to about 100,000 rpm. Also, by using multiple images, speeds below 600 rpm. may be measured. Accuracy plus or minus 1% of dial reading above 900 rpm. when the "Strobotac" is standardized in terms of a frequency controlled power line. Controls for this standardization adjustment are provided. Strobotac operates on 105 to 125 volts, 50/60 cycles, consumes about 35 watts. Measures, overall, 7½″ x 8¾″ x 9⅞″. Weighs 9½ lbs. Accessories supplied include 7-ft. cord and plug plus a plug for contactor jack, also spare fuses.

Available from: Electronic Measurements Co.

E-420

More Light From Lamps

Features claimed: Sheldon Master lamps that furnish almost 100% higher light output with no additional current consumption are announced in the flood, spot, and clear R-40 design. For example, the 100-watt reflector

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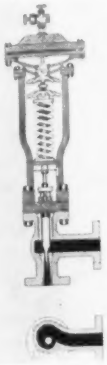
515 West Windsor Road, Glendale 4, California

flood lamp has an initial beam candlepower of 1,950, whereas the conventional 100-watt R-40 lamp has 900 candlepower. These unusual lamps are ideal for any interior application where higher light output, where savings in current, and where less heat are considerations. They replace conventional R-40 lamps. Factors that make this light intensity possible are: quality aluminized inside reflectors, filament construction and placement. 100 and 150 watts. $1.15 list.

Available from: Sheldon Electric Co.

E-421

Complete Flow Regulating Valve Line



Features claimed: These units are designed to handle steam and water at high pressure drops, and flashing condensate. They can be used for drainage for stage heaters, evaporator coils, flash tanks, process systems, subcooled heaters, etc., where high-velocity impingement causes frequent maintenance or valve replacement. All internal parts of the valve are made of stainless steel, treated and ground to precision.

Available from: The Swartwout Company.

E-422

Plate Magnets Decrease Explosion Hazard

Features claimed: These non-electric plate magnets virtually eliminate fire and explosion hazard which exists

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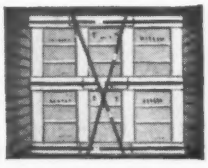
Signode field engineers, working with shippers and carriers, developed this modern method of carload bracing — a scientific combination of steel strapping and lightweight wood bulkheads.



The results are typified by this on-arrival picture of a carload of kitchen ranges. Damage—none; cash savings on materials used—$7.16; reduction in dunnage weight—115 lbs.!

it's a fact to remember!

Regardless of what, where or how you ship, the improved packaging and shipping techniques constantly being developed by Signode steel strapping specialists are worth investigating . . . today if you're engaged in **DEFENSE** or **ESSENTIAL** civilian production . . . or **TOMORROW** when the need to cut costs and increase sales may become more urgent than ever before.

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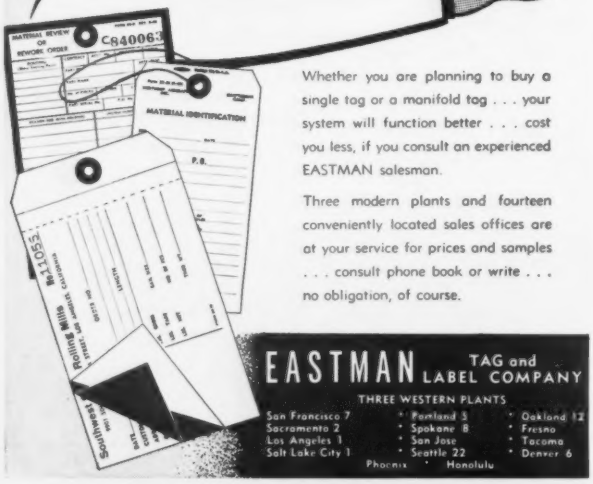

Whether you are planning to buy a single tag or a manifold tag . . . your system will function better . . . cost you less, if you consult an experienced EASTMAN salesman.

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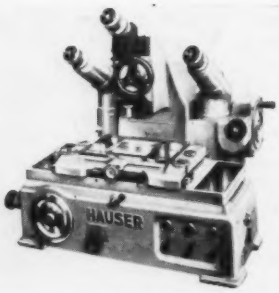
when chemicals-in-process are not fully purged of stray iron and steel. One 12-in. width magnet is installed on a chute carrying five tons of bauxite per hour at a depth of 2 in. Another 9-in. model removes iron and steel from Diphenylguanidine on a chute carrying 625 lbs. per minute at a depth of 1 in. In both cases, all ferrous contamination is pulled to the magnets and strongly held until manually removed. Used at the Warners plant of American Cyanamid Company.

Available from: Eriez Manufacturing Company.

E-423

Precision Measurements With New Machine

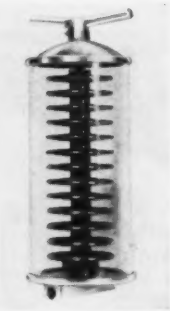


Features claimed: This measuring machine offers precision measurements with direct optical reading to .00005 in. without the use of micrometer-screws. Universal application, simple handling, and direct optical reading of measurements in graduations of 1 in., .1 in., .01 in., .001 in., .0001 in., and .00005 in. characterize the device, Type P324.

Available from: Hauser Machine Tool Corporation.

E-424

Glass Walled Filter for Research Use



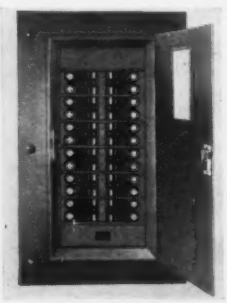
Features claimed: Full observation of the action of the filter is possible with this new glass walled model. It is very useful in research and development work where the influent suspensions tend to have variable properties. It is fabricated from porous stainless steel sheet, void percentage 50%, with pore openings of closely controlled size. Filter elements are of extremely compact construction and as much as 8 sq. ft. of filter area may be contained in a transparent body 4½ in. in diameter and 40 in. long.

Available from: Micro Metallic Corp.

E-425

Fusible Panelboard for Branch Circuit Control

Features claimed: These new devices provide plug fusible branches with heavy duty toggle switches for lighting and appliance branch circuit control. They are available from 4 to 40 circuits for use on either AC or DC applications. The device is a 17-in. by 4½-in. deep box with 4-in. wide wiring gutters. Ample knockouts are provided in the ends and sides. Four branch circuits are contained in the high strength, one piece molded bakelite blocks which comprise the heart of these NTPR panelboards.



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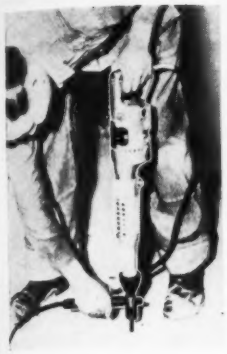
E-426

Portable Electric Drill, Hammer Combo



Features claimed: The Do-All can be used for drilling concrete and masonry, metal and wood and for driving, grinding and buffing and wire wheels. It is built to stand hard continuous usage. It is fully equipped with ball-bearings with sealed lubrication and the whole tool is easy to maintain. The machine is powered by a universal motor with fan ventilation, and the operating switch is conveniently located in the handle. It can be attached to any lamp socket, runs on either direct or alternating current of from 25 to 60 cycles. Ready for use, it weighs only 15 lbs.

Available from: Wodack Electric Tool Corporation.

E-427

Recorder Measures Rotor Temperature

Features claimed: Accurate and quick measurement of temperature of rotors in large electric generators is possible with this new electronic recorder. The instrument has a range of 0 to 150 deg. C., a limit error of 1.5 deg. C., a dead zone of 0.3 deg. C., and a pen speed of 1.4 min. full scale. In addition, the instrument furnishes a 12-in. strip chart record which can be used as a guide for gradually cooling a generator.

Available from: Minneapolis-Honeywell Regulator Co.

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ave lost time, eliminate bottlenecks and wasted motions—increase production capacity by streamlining handling of material with the type of Nutting Trucks suited to your work. For quicker delivery a great variety of standard types are available—also wheels and casters with demountable rubber tires, all sizes for any truck.

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Fig. 1136

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Ali-Rite Corporation.....801 Jefferson St., Oakland, Calif.
E. Bennett Co.....426 N.W. 6th Ave., Portland 9, Ore.
Record Sales Company.....95 Connecticut St., Seattle 4, Wash.
H. McVeigh.....West 310 First Ave., Spokane 8, Wash.
Equipment Supply Co.....60 Richards St., Salt Lake City 1, Utah
Donald-Hunt Scale & Supply Co.....1540 Waxee St., Denver 2, Colo.
Wm W. Jones.....5th Ave. at Jackson St., Phoenix, Ariz.
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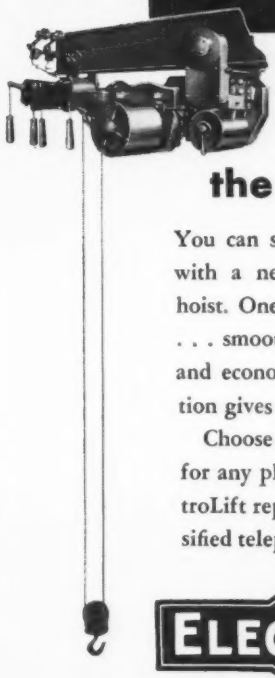

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HELPFUL LITERATURE

for the plant operator who wants to keep informed

428-L

A Brush Up on Brushes

A new three-color brushing catalog, designed to simplify selection of the best brush for the individual job, is offered by the Osborn Manufacturing Company. The 76-page catalog (201) contains numerous illustrations of industrial brushing operations in addition to photographs and descriptions of the complete line of power, paint, varnish and maintenance brushes. The catalog can be obtained from R. R. Schultz, Advertising Manager, *The Osborn Manufacturing Company*, 5401 Hamilton Ave., Cleveland, Ohio.

429-L

Hand Forged Tools

More than 300 hand service tools for farm, industrial and garage use are illustrated and described in the 24-page catalog issued by the *P & C Hand Forged Tool Company*, Portland, Ore.

430-L

Rugged Flooring Surfacers

Industrial floors which must stand up under heavy duty wear are the targets for Flintz and Quick Floor, resurfacing agents fully explained and described in two new bulletins issued by *Dura-Tred Company*, 357 N. Central Park Blvd., Chicago, Ill. Application techniques, physical characteristics and illustrations showing cases before and after are included in the two bulletins.

431-L

Sacramento Area Economy

A complete profile of the Sacramento, Calif., area called "The Economy of the Sacramento Area and Its Potentials for Industrial Development" is off the press. The study, undertaken by the *Industrial Survey Associates*, San Francisco, for the Sacramento Chamber of Commerce, contains 94 pages of textual material, charts, graphs and tables which seek to explain the industrial capacities of the area. The appendix has statistical tables on area behavior, geological information and industries suitable for the Sacramento area.

432-L

Wood Products Moisture Meter

The TAG midget moisture meter, designed to determine instantly the moisture content of wood, lumber, plaster and wood products, is described in a 6-page bulletin issued by the *Tagliabue Instruments Division*, Dept. 67, Weston Electrical Instrument Corporation, 614 Frelinghuysen Ave., Newark, N. J. Moisture measure by electrical resistance is explained in the bulletin (1295) and specifications are included.

433-L

Instant Metal Hardness Tester

This descriptive folder relates the distinctive design of the Direct Reading Metal Hardness Tester, for on-the-job readings of all types of metals. The bulletin, ET181, has illustrations and detailed principles of operation, advantages and applications. Write *Newage International, Inc.*, 521 Fifth Ave., New York, N. Y.

434-L

Dry Cleaning Detergent

Thriftex, a new dry cleaning soap which is both a detergent and an emulsifier, is described, and instructions for its use are presented in a bulletin issued by the *Pennsylvania Salt Manufacturing Company*, 1000 Widener Bldg., Philadelphia, Pa. Ask for service bulletin No. 19.

435-L

Any Lumber Today?

West Coast Lumbermen's Association announces publication of its January 1, 1951 "Where to Buy," designed to aid buyers of Douglas fir, West Coast hemlock, Sitka spruce and Western red cedar. Detailed information is given on sawmills, remanufacturing plants, timber fabricators, wood pipe and tank manufacturers and wood treating plants in the Douglas fir region of western Washington, Oregon, and northern California. Copies of the directory which lists 66

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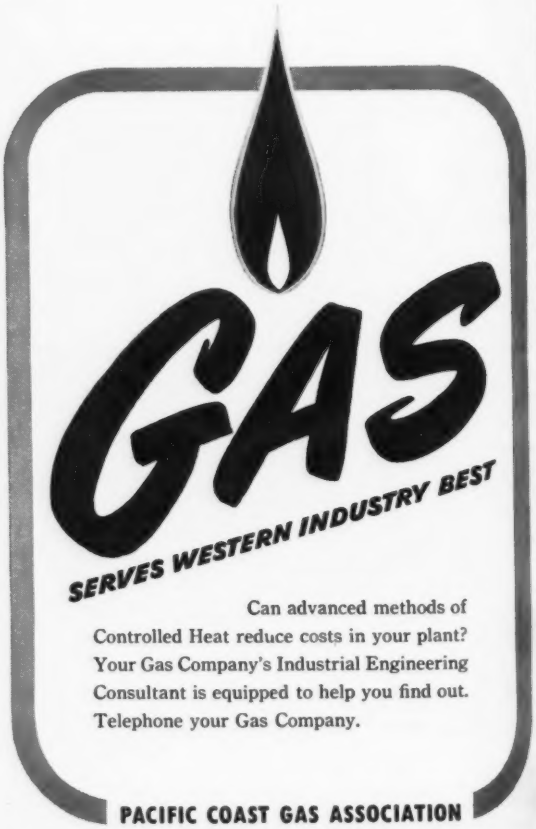

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PACIFIC COAST GAS ASSOCIATION

IN these times of scarcities, all users of felt will be glad to know that *immediate delivery* of American Felts can be made throughout the Pacific Coast area from stockpiles maintained by our Sales Agents, the A. B. Boyd Company.

American Felts available include those listed in Armed Forces specifications, which can be met exactly. In addition to supplying American Felt to exact requirements in sheet and roll form, the Boyd Company operates a skilled cutting shop which will produce cut parts to exact dimensions.

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• 404 DEXTER AVE., SEATTLE 9, WASH.

American Felt Company
TRADE MARK

new member mills are available from the association offices, 1410 S.W. Morrison St., Portland, Ore.

436-L

Colloidal Graphite

"Colloidal Graphite as a Parting Compound" is a new bulletin describing the use of colloidal graphite dispersions in metalworking, glass, rubber and corrugated boxboard industries. The literature is available through the *Acheson Colloids Corporation*, Port Huron, Mich.

437-L

General Industrial Hose

New York Belting and Packing Company has published a new 16-page catalog on fire hose and general industrial hose. Engineering data, construction specifications and other information designed to aid engineers in the selection and care of fire hose are included.

438-L

Humidity Control

Current technical and operating information on Kathabar humidity control equipment appears in a new publication released by the *Surface Combustion Corporation*, Toledo, Ohio. The bulletin, called "The Humidity Engineer" is being published periodically by the firm and distributed to all persons concerned with the humidity control field and its problems.

439-L

Portable Electric Drill Gun

A new ¼-in. Desoutter Portable Electric Drill Gun, Model S2, for general utility work in industrial plants is discussed in a descriptive bulletin STP 181 available through the manufacturer, *Newage International, Inc.*, 235 East 42nd St., New York, N. Y.

440-L

"Economic Coal Storage"

An 8-page bulletin released by the *Allis-Chalmers Tractor Co.* describes the safe coal handling method for industrial purposes. Photographs show the tractor-scraper team in action.

441-L

Copying Anywhere in Office

Charles Bruning Company, Inc., 100 Reade Street, New York, N. Y., issues an 8-page booklet describing their new Copyflex machine, designed to make direct, positive copies anywhere in the office. Pictures and diagrams, showing the operation and construction of the machine are included in the descriptive booklet.

442-L

Hydraulic Pullers and Jacks

Three products of *Templeton, Kenly and Company*, 1020 S. Central Ave., Chicago, Ill., are introduced in a new bulletin. Re-Mo-Trol pumps and rams, Jenny centerhole pullers, and Standard-Hydraulic jacks are fully explained and illustrated for convenient reference.

443-L

Ion Exchange Systems

The "Penfield Pays" folio, containing catalog sheets and other pertinent information regarding Penfield Ion Exchange systems ranging in capacity from 30 to 1,000 gallons per hour, is available from *Penfield Manufacturing Co.*, 19 High School Ave., Meriden,

TRUCKS

More than 188 specialized hand trucks are stocked and available.

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HERE'S YOUR PARTNER TO BIGGER SAVINGS IN *PALLETIZING*

Weld-Bilt *Pallet-Type* HYDRAULIC LIFT TRUCK

You'll speed up and simplify pallet-moving of materials — with the "Weld-Bilt" Pallet Truck! It's built to handle a greater variety of single or double-faced pallets easier and faster. Easier on truckers, too.

Check the design and construction of the "Weld-Bilt" and you'll know why. The sturdy forks, with their greased-for-life ball bearing wheels are easier to handle and position under loads of 2,000 and 4,000 lbs. Other features include: Multi-stroke hydraulic lift, accelerator type lowering pedal, "anti-kick-back" safety handle, front wheel equalizer, and many others — all built for longer service, easier operation.

WRITE FOR "WELD-BILT" PALLET TRUCK BULLETIN 1149.

WELD-BILT Equipment Includes:
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OAKLAND, CALIFORNIA: Erwin C. Rohr, 600 16th St.
SEATTLE 99, WASHINGTON: Air-Mack Equipment Co., 614 Elliott Ave., West.
PORTLAND, OREGON: Air-Mack Equipment Co., 705 South East Union St.
SALT LAKE CITY, UTAH: Arnold Machinery Co., Inc., 153 W. Second South St.

WEST BEND EQUIPMENT CORPORATION
MATERIALS HANDLING ENGINEERS
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Conn. Each catalog sheet in the folio, in addition to containing a photographic illustration and working diagram of a particular model Penfield Industrial Demineralizer, also lists a complete description of parts, and features both a specifications chart and a performance chart.

444-L

Defense Production Bulletin

Heating and treating equipment for defense production is the topic of a new bulletin issued by the *Surface Combustion Corporation*, Toledo, Ohio. The 8-page, 3-color bulletin covers heating for forging as well as heat treatments to develop the required properties for the production of all kinds of ordnance material.

445-L

Applying Speed Reducers

Falk speed reducers, couplings, gears and Motoreducers and their application are illustrated and described in some new literature released by the *Falk Corporation*, Milwaukee, Wis.

446-L

Temperature Controls for Industry

"Industrial Control" for temperature, flow, pressure, liquid level and humidity is described in a new catalog from the *Minneapolis-Honeywell Regulator Company*, Wayne and Windrim Ave., Philadelphia, Pa. A number of additions to the previous line are shown.

447-L

"The Valve World"

Crane Co., 836 Michigan Ave., Chicago, Ill., manufacturers of valves, fittings, pipe, etc., publishes a newsworthy magazine in which the latest developments among their products, diagrams and photographs are prominently featured.

448-L

"More Holes in a Hurry"

A pocket size booklet designed to give users of portable electric drills maximum service through quick reference is offered by the *Mall Tool Company*, 7728 S. Chicago Ave., Chicago, Ill.

449-L

Remote Control Dictation

Introducing the new Televoice device for multiple economic dictation, a new booklet called ". . . a line on Televoice" has been issued by *Thomas A. Edison, Incorporated*, West Orange, N. J.

450-L

Oil Filter Facts

"Don't Buy Trouble" is the title of a new booklet on oil filters offered by the *Caterpillar Tractor Co.*, Peoria 8, Ill. A brief history of lubrication is included in the 16-page booklet along with diagrams and photographs of oil processes.

451-L

Production Control Reference

Efficient and accurate record-keeping management to assure continuous and uninterrupted production flow is high-lighted in "Production Control in Manufacturing Industries," a booklet just issued by *Remington Rand, Inc.*, 315 Fourth Ave., New York 10, N. Y. The descriptive 46-page booklet includes punch card methods for every phase of production control.

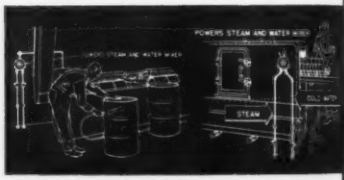
For a Small, Localized Supply of Warm

HOT WATER *Use* **POWERS**

STEAM and WATER MIXERS

ECONOMICAL—Quickly pay back their cos Thousands now in use. *Easy to Install.* R quires steam and water pressures above 1 lbs. Steam is mixed directly with wate

MANY USES—Industrial processes; 180° sterilizing rinse water for dishwasher washing oil drums, trucks, etc.



TEMPERATURE RANGE—Any temperature d sired between that of incoming water a 200° F.

HAS PRESSURE EQUALIZING VALVE—which pr vents delivery temperature changes caus by fluctuating pressures of steam or wat

SMALL SIZE—½" pipe size can be held in th palm of the hand, has 5" dial; ¾" size h 7" diam. dial.

CAPACITIES—based on steam and water 45 lbs. pressure each, water at 60° F., an delivery temperature of 160° F.: –½" siz =3 gals. per min.; ¾" size=8 gpm. Mi ing steam with 140° F. water increases d livery about 75%. Often used as a sma booster heater. *WRITE for Bulletin 358-*

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READING GUIDE FOR WESTERN MANAGEMENT

A service for all management levels . . . current literature surveyed and appraised by the faculty of the School of Management, Golden Gate College

Developing Men for Controllership

By T. F. Bradshaw, Division of Research, Graduate School of Business Administration, Harvard University, Boston, 1950, $3.25.

This volume is clearly the best work on the subject that has come to this reviewer's notice to date.

In *Developing Men for Controllership*, Mr. Bradshaw has neatly brought together the general problem of on-the-job training for top management positions and the special problem of on-the-job training for controllership. This he does by means of a thorough analysis of the general problem of staffing management functions.

With reference to controllership Mr. Bradshaw shows (1) how the control function is related to and is really a part of top management, (2) that American colleges and universities have not, to date, developed any well integrated programs for training men for the controllership function, and (3) that on-the-job training must, for the present at least, provide the answer.

This is followed by an excellent discussion of why enterprises should plan for management development. How this planning may be done is well and fully illustrated by the actual practices of such nationally known enterprises as Esso Standard Oil Company, Vick Chemical Company, and International Petroleum Company.

Although, in varying degrees, many enterprises provide general programs of management training, few include the control function. The practices of three leaders in the field, Armstrong Cork Company, Caterpillar Tractor Company, and United States Steel Corporation are presented in some detail. Primary emphasis is placed upon the type of man selected for the training program. Most important of all is the emphasis placed upon the belief that "proficiency in accounting is but a small facet of the many-sided man who should staff the controller's department."

Because this work embodies the current practices of those enterprises which have taken the long view of management training and development, it should provide the basis for others to embark upon similar programs.

Reviewed by:
DR. EDWARD J. KELLY
Dean, School of Accountancy

Briefer Guides From The Management Library

Manpower Planning for National Emergency

Metropolitan Life Insurance Company, Policyholders Service Bureau, New York, 1950.

One of industry's chief mobilization problems is to make the best use of manpower during national emergencies. This report is designed to assist management in directing attention to problem areas in manpower planning.

Military Management for National Defense

By John Robert Beishline. Prentice-Hall, Inc., New York, 1950, $5.00.

The author, a Colonel in the U. S. Army (with a Ph.D. in Industrial Management), applies the science of industrial management to military problems. Management techniques are fused with the best principles of military organization. This book will have special interest for the businessman who is engaged in supplying the military, or the manufacturer of war materials who needs to understant military organization.

Company Programs of Executive Development

National Industrial Conference Board, New York, Studies in Personnel Policy No. 107, 1950.

This account of how nine well-known companies have gone about developing executive talent reveals an emphasis on management teamwork and the importance of suiting the program to the needs of the organization. Twenty different training techniques are described.

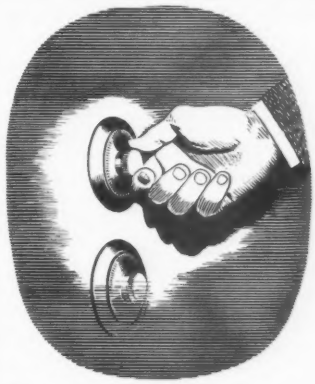
Property Risks and Coverages Under Mobilization

American Management Association, New York, Insurance Series No. 88, 1951.

Includes: The Atom—your personal and property risks. New problems in transportation insurance. Insurance problems in a mobilization economy. Trends in group and social insurance.

Reviewed by:
BERNA M. CARLSON
College Librarian.

The *RIGHT* COMBINATION



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1 Competent Advice from Your Local Insurance Agent or Broker . . .

2 Cal-Western's "TAILOR-MADE" Group Insurance Plans . . .

California-Western States LIFE INSURANCE COMPANY

HOME OFFICE: SACRAMENTO

GROUP INSURANCE SALES OFFICES IN PRINCIPAL WESTERN CITIES

THE WEST ON ITS WAY

CALIFORNIA

BUCK ROGERS IN SAN DIEGO—America's first integrated production plant for supersonic guided missiles is a new division of Consolidated Vultee Aircraft Corporation, San Diego, under contract to the U. S. Navy's Bureau of Ordnance. First production project involves a supersonic anti-aircraft missile. At its peak, the new division should employ 1,500 workers.

INDUSTRIES JOIN HANDS FOR CONTRACTS — Pacific Defense Industries, Prime Contractors, Bank of Commerce Bldg., Oakland, is organized for the purpose of pooling resources of industrial plants in Pacific Coast States to expedite the procurement and handling of defense contracts. News of bid requests, contracts and negotiations and other services will be provided for member companies.

VENETIAN BLINDS GET BUCKS—Lite-Tite, 4840 W. Jefferson Blvd., Los Angeles, West Coast venetian blind company, gets $300,000 in backing from Charles White, president of American Lumber Mills and vice president of Johnson Lumber Company, Inc. Lite-Tite uses a new production technique which reduces production costs about 30%. (See *Western Industry*, July 1950, page 58.)

VALVE ASSEMBLIES CORPORATION—Missile Valve Company, 8945 Venice Blvd., Los Angeles, is a new manufacturer specializing in valve assemblies. The company offers immediate service on special design and production of such items as pressure regulators, relief valves, shut-off valves or check valves.

JETS OVER ANTELOPE—Expansion of Lockheed Aircraft Corporation activities into Antelope Valley now include plans for establishment of a jet aircraft depot at Palmdale Airport. Space leased from Los Angeles County, is at southwest end of the county's new Palmdale Airport runway and will hold a $400,000 hangar. The hangar will serve as a delivery station where jet fighters and trainers will receive final testing before being turned over to military pilots.

LINE-UP FOR CONVAIR LINERS—Continental Airlines are third and Braniff Airways, fourth, in ordering Consolidated Vultee Aircraft Convair-Liner 340's in ten days. Continental purchased seven of the new models. Braniff purchased 20 of the new transports which will accommodate 44 passengers. Hawaiian Airlines and United Airlines have already purchased some 340's.

AIR MAINTENANCE TRAINING AT OAKLAND AIRPORT—Aero Industries Technical Institute has a U. S. Air Force contract for training airplane body and engine maintenance workers at its Oakland Airport headquarters. The program will reach a maximum of 800 students and 220 Air Force men are already receiving instructions at the school.

LOCKHEED 5-STORY OFFICE BUILDING—At a cost of $2,000,000, Lockheed Aircraft Corporation is constructing a new building to serve as headquarters for various departments scattered around its Burbank plant. Basement floor of the new 165,000 sq. ft. structure will be bombproof.

WHEN IN ROME—STUDY ITS INDUSTRIES—Stanford University Research Institute, Palo Alto, has reached an agreement with the Italian government for an extensive industrial survey and analysis of Italy's mechanical industries. At least 13 American engineers and economists and an equal number of Italian specialists will be involved in the study.

CHEMICAL PLANT PLANS EXPANSION — Monsanto Chemical Company's new styrene plastic plant, Long Beach, plans expansion to permit more than 100% increase in production capacity. New equipment should be completely installed by July.

SYNDICATE PURCHASES OPTICAL COMPANY — A West Coast syndicate headed by officers of International Glass Corp. has purchased the Hoeppner Optical Co., South Gate, and has financed an expansion program to develop Western production of high-quality optical glass.

TEA TIME IN SAN LEANDRO—Tea Garden Products Company will establish a new $600,000 plant in San Leandro's industrial district. Construction will start immediately on a six and one-half acre site on West 132nd Ave.

NEW DIVISION FOR NORTH AMERICAN—A new electro-mechanical division is announced by North American Aviation, Inc., to handle the design development and manufacture of electronic equipment and complete guidance control systems for missiles and aircraft.

ESSICK TAKES STOCK—Essick Mfg. Co., 1950 Santa Fe Ave., Los Angeles, acquires all the stock of the Sterling Machinery Corp., Kansas City, Mo., pump and mining hoist manufacturers.

REHABILITATE CONSTRUCTION EQUIPMENT—Shepherd Tractor & Equipment Co., Los Angeles, get the go-ahead from the U. S. Navy Bureau of Yards and Docks to proceed with the rehabilitation of 288 pieces of heavy duty construction equipment out of Port Hueneme. The work involves a contract of well over $1,000,000 and covers the repair and rebuilding of earthmoving equipment to be used by the Seabees.

HADACOL HAD TO COME—LeBlanc Corporation, Lafayette, La., makers of Hadacol tonic, are purchasers of a plant on 4¼ acres of land in Claremont.

AERO-COUPLING BUILDING — Construction is in progress on Aero-Coupling Corporation's new building at the corner of Winona Blvd. and Ontario Street in Burbank. The property contains approximately 41,000 sq. ft., and the building will be approximately 30,000 sq. ft. Cost is in excess of $200,000. Productive capacity should be increased about 200% when the new structure is completed around May 1.

KAISER ALUMINUM, YOU ALL—Kaiser Aluminum & Chemical Corporation selects New Orleans, La., area as site for construction of a new 200,000,000 pound-a-year aluminum reduction plant and power facilities. The Kaiser company also paid the U. S. Government $37,394,250 in purchase mortgages on five aluminum plants, 23 years before final payments would be due. Commitments totaling $115,000,000 have been signed by the company for private financing in connection with its expansion program. Eighteen insurance companies agreed to purchase $75,000,000 of first mortgage 25-year bonds, bearing 3⅝% interest, series due 1976, and eight banks

MACHINERY PLANT EXPANDS—Consolidated Machinery & Supply Co., Ltd., expands its manufacturing facilities at 2031 Santa Fe Ave., Los Angeles, by adding over 18,000 sq. ft. of floor space including an entire new building. View below is of new assembly area for Consolidated's Comet line of saws and home workshop tools.

will loan Kaiser Aluminum $40,000,000 at 3⅛% interest, fully payable in semi-annual installments by November 30, 1955.

NEW INDUSTRY SQUEEZES ORANGES OUT—Robertshaw-Fulton Controls Co., Greensburg, Pa., will erect a new manufacturing plant on a 20-acre orange grove near Anaheim. The automatic controls firm plans to employ about 2,000 in its 225,000 sq. ft. plant.

7,000 FREIGHT CARS—The purchase of 7,000 additional freight cars has been authorized by Southern Pacific Railroad directors. Cars will be built in company shops and bring the total number existing and planned cars ordered since the end of World War II up to about 35,000.

STEEL PICKLING PLANT—Rich Steel Pickling Co. announces opening of new facilities at 8019 Beach St., Los Angeles. Sheets, plates, coils, bars, pipe, structural shapes, stampings, etc., can be pickled—either dry or oiled—at the new facilities.

STEEL FABRICATORS IN RICHMOND—Pacific Fabricators, Inc., 1209 MacDonald Avenue in Richmond are a new Coast company set up to do defense work in the fabrication of steel products and electronic devices.

FIBREBOARD PLANT DEVELOPMENT—Fibreboard Products Inc. expects to spend over $5,000,000 on a plant development and improvement plan during 1951. Stepped up capacity, efficiency and production are the anticipated results when the projects are completed in 1952.

AMERICAN CAN IN STOCKTON—Construction work on the American Can Company's newest California plant to cost several million dollars and to have a capacity for 350,000,000 metal containers a year, is under way at Stockton. The plant is on a 39-acre tract at U. S. Highway 50 and South California St., in the south end of the city.

FRUIT INDUSTRIES NAME CHANGES—Fruit Industries, Ltd., announces the change of the company name to California Wine Association, which is more descriptive of the wine-grower cooperative than the previous name.

AMMUNITION BOOSTERS FROM AIRESEARCH — Initial orders, for .50 caliber ammunition boosters for U. S. Army tanks, totaling approximately a half-million dollars have been received by the AiResearch Manufacturing Company, 9851 Sepulveda Blvd., Los Angeles. The boosters will enable tanks to maintain uninterrupted fire in critical tactical situations, and continuous fire over the roughest terrain.

COLD ROLLED STRIP STEEL — Expanded facilities for producing cold rolled strip steel in the West are announced by the California Cold Rolled Steel Corporation of Los Angeles. Ground-breaking is under way on an all-steel structure for housing annealing furnaces. Three new furnaces are being added and will provide a 42% increase in annealing capacity over present equipment.

TWO ELECTRONICS LABS — Stanford University, Palo Alto, will build two new electronics laboratories, one for applied research and the other for student electrical engineering activities. Cost of the construction will be $250,000.

IMPORTANT TRUCKING DEAL—Mack Manufacturing Corporation, New York, and Wooldridge Manufacturing Company,

SURPRISING SAVINGS

Reported by Users of
STANDARD PNEUMATIC TUBE SYSTEMS

SAFE — SWIFT DELIVERY BY "AIR" OF MESSAGES — MONEY — MERCHANDISE!

Savings as high as $10,000 in 9 months' time are reported by users of Standard Pneumatic Tube Systems — filling orders, moving merchandise, money, messages, records, between departments. Reduce messenger and telephone service. Can be installed for a wide range of needs in stores, warehouses, manufacturing plants, offices. Write for Bulletin No. 11 and complete information — address Dept. WI-41.

STANDARD CONVEYOR COMPANY
North St. Paul 9, Minn.

Write for Bulletin No. 11 — Standard Pneumatic Tube Systems. Address Dept. WI-41.

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"The West's First Cold Rolled Strip Mill"

Producers of

COLD ROLLED
STRIP STEEL

Meeting rigid specifications on cold rolled strip steel is Calstrip's daily job. Strip steel of any temper—or with special edges—can be rolled to your order on our mills. Size ranges include thicknesses to 1/8", and widths up to 13".

Our service facilities include rotary slitters, roller leveler and shear, cold reduction mills, and bright annealing furnaces.

CALSTRIP STEEL CORPORATION
7140 Telegraph Road • Los Angeles 22, Cal. • UNderhill 0-1344

Sunnyvale, announce an agreement which marks a big step in the growth of Western heavy industry. Wooldridge will partially produce and fully assemble Mack off-highway vehicles in their main Sunnyvale plant. This means an immediate increase in employees at Wooldridge as well as the construction of a new assembly plant.

GARRETT PURCHASES PROPERTY—Garrett Corporation, 9851 Sepulveda Blvd., Los Angeles, is purchasing ten acres of property adjacent to the 33 acres on Sky Harbor Airport already leased from the City of Phoenix, Ariz. The industrial tool and airplane parts company makes the purchase for its expansion program.

COLORADO

COLORADO PIPE-LINE OKAYED — Colorado Public Utilities Commission gives approval to Grand Valley Pipeline Co. on its proposed $2,308,000 natural-gas pipe line from Piceance Creek field to Grand Junction. Service would also be given to Rifle where the U. S. Bureau of Mines' oil-shale plant is located, Newcastle, site of a proposed paper plant, plus other areas in Western Colorado.

IDAHO

IDAHO STATE AND AEC—Negotiations are in progress between Idaho State College, Pocatello, and the Atomic Energy Commission for a contract covering radiological investigations at the AEC's reactor testing station in southeastern Idaho. Work would involve determination of quantities of certain radioactive materials in ground water and the soil of areas in and adjacent to the reactor testing station.

NEVADA

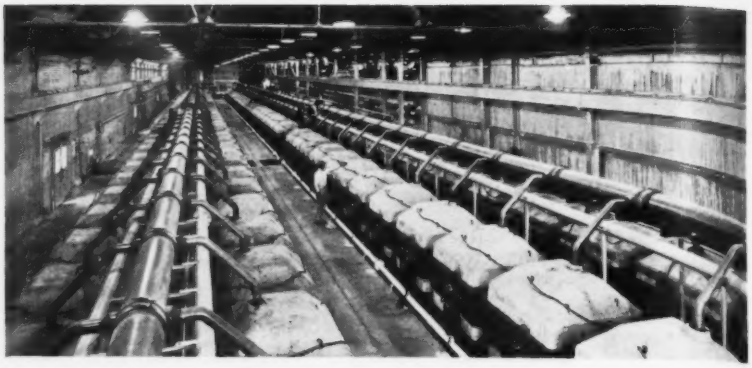
LEAD OUT BY JULY—The new titanium treating plant of National Lead Co. at Henderson, should be in production by July. About 500 will be employed, and facilities costing about $1,000,000 will be fully installed.

STATE PAYS ON MAGNESIUM INDUSTRIES—Approximately ¼ of the $24,000,000 purchase price for Basic Magnesium Industries, near Hoover Dam, has been paid by the State to the federal government. Balance to be paid is about $17,000,000, but the Colorado River Commission for Nevada in charge of the holdings has decided to sell the property to public or private interests.

MONTANA

FURNACE SMELTER CONSIDERED—Chromium Mining & Smelting Corp. might erect a two furnace smelter at Glendive, for handling low grade chromite ores. Chrome production would reach about two million pounds a month if the $1,500,000 project goes through.

RADIO ON FREIGHT TRAINS — The Northern Pacific Railway announces it has ordered equipment costing $150,000 to provide end-to-end radio communications on through freight trains operating between Dilworth, Minnesota, and Glendive, a distance of 410 miles.



Expanding pulp plants "gotta have" more chlorine. This new installation of Type S-3 chlorine cells shows what Hooker Electro Chemical Company at Tacoma have done.

OREGON

TIMBER—AND HOW!—About 540 million board feet of high grade timber near Gold Beach have been purchased by Associated Plywood Mills, Inc., Eugene, from Lloyd Corp., Los Angeles. Purchase will keep the company's mills in operation for many years.

FIRM BUYS DIE CASTING MACHINERY — Product Engineering Company, Portland, expands its operation with the purchase of all die casting machinery from Pacific Die Casting Company of the same city. Product Engineering can now handle all types of die casting jobs.

OSC GETS ATOMIC RESEARCH—Of the 15 new unclassified physical research contracts awarded by the Atomic Energy Commission, Oregon State College, Corvallis, receives one in physics and one in chemistry.

INDUSTRIAL DEVELOPMENTS — In Portland, construction work on the Amalgamated Sugar Company liquid sugar and warehousing plant has begun. The 60 x 90-ft. concrete structure will cost about $100,000. A new $2,000,000 cooperative plywood plant is planned in Portland by Columbia Plywood Association. Output of six million feet of plywood and the employment of 600 workers is planned if the proposed financing plan is successful. Part of Fibreboard Products, Inc.'s planned $5,000,000 expansion program will add considerable equipment in its Portland plant. A new gluer, additional presses and other heavy machinery will be installed.

SALEM PLANT PURCHASED—Ray-O-Vac Co., Madison, Wis., purchased the big Salem plant of the Continental Chemical Co. Plant was built by the government during the war at a cost of about $5,000,000. Manufacture of manganese dioxide for use in production of dry cell batteries and ammor-dum sulphate fertilizer will continue.

WESTINGHOUSE TELEVISION—Westinghouse Electric Corp. may give a contract to Doernbecher Manufacturing Co., Portland, for making television cabinets.

HYSTER EXPANSION—An expansion program that will increase manufacturing capacity at least one-third through enlargement of fabricating and machining facilities is under way at Hyster Company's three plants, one of which is in Portland. The assembly building is being extended a total of 400 feet to provide more space for present assembly equipment and centralization of the plate shop.

UTAH

PIPE PLAN—Salt Lake Pipe Line Company, Standard Oil Company of California subsidiary, plans to increase the capacity of petroleum products line from Salt Lake City to Pasco, Wash. Estimated cost of the project, which includes installation of additional tank storage, would be about $1,000,000. The line might also be extended to Puget Sound if demand increases.

KAISER COAL—Kaiser Steel Corporation, Oakland, Calif., formally entered the commercial coal business with the announcement that the Utah Fuel Company, a wholly-owned subsidiary, is now merged with the parent company. The company was purchased by Kaiser a year ago.

PERMIT PIPE LINE—Utah Natural Gas gets a conditional permit from the Utah Public Service Commission for construction of a $32,000,000 pipeline from southeastern Utah gas fields to Salt Lake City. Conditions include proof of financial backing, geological proof of reserves available and contract copies of the company's arrangement with a reliable construction firm.

GIVE THEM AIR—Whitmore Oxygen Co. is beginning a $250,000 expansion program, which includes new plant construction near Salt Lake City. Machinery for production of both oxygen and hydrogen will be installed.

CATALYTIC CRACKING UNIT — Expenditure of about $10,000,000 is anticipated by Phillips Petroleum Co. for installation of a 10,000-barrel catalytic cracking unit at its Woods Cross plant. Construction should start this summer and be complete by July 1952. Other improvements are also planned.

WASHINGTON

MAGNESIUM AT MEAD—Contract for the rehabilitation of Mead Magnesium plant, north of Spokane, goes to Morrison-Knudsen Co. and H. K. Ferguson Co. The $1,500,000 project will take about 90 days

to complete, and then magnesium production starts for the government.

BARGAIN FOR BAUXITE — Tacoma Chamber of Commerce Industrial Department is negotiating for the location of a $20,000,000 bauxite plant on the Nisqually flats. The plant would employ about 500 persons.

PLYWOOD PLANT SOLD — Woodlawn Plywood Co. plant at Hoquiam was sold to A. W. Braun and Associates of Olympia.

POWER PEACE—After long negotiations, a threatened strike, and many fringe difficulties, Seattle City Light took over Puget Sound Power and Light and became the only distributor of electric power in the Seattle and surrounding area. A bond issue of $25,850,000 furnished the purchase price.

CEMENT FIRM EXPANSION—If the National Security Resources Board gives its approval, Portland Cement Company, Spokane, plans a $3,500,000 expansion program at Irvin, which would double the size of the plant. The project would take about a year and a half to complete.

ALCOA MIGHT COME—A new aluminum reduction plant to be located in the Pacific Northwest might be established in Grand Coulee or south of Wenatchee by Alcoa. A prerequisite is the required amount of electric power. The final decision rests with Interior Department officials in Washington, D. C., and other interested agencies. The project would cost about $30,000,000.

INDEPENDENT PACKING AGAIN — Sunnyside Packing Co., Sunnyside, goes back in operation this season as an independent canner and quick-freezer. Yakima County Horticultural Union has operated the plant under lease for the past two years. The new independent will concentrate more on frozen output.

PLYWOOD IN CALIFORNIA—Peninsula Plywood Corp., Port Angeles, plans to build a plywood plant at Crescent City, Calif., to be known as the Crescent City Plywood Corp.

PLYWOOD INCORPORATED—National Plywood Co., Inc., Port Angeles, have filed articles of incorporation and propose to build a plywood plant near Lake Pleasant.

WYOMING

OPERATION GAS ABSORPTION—Operation is under way at Church Buttes site of Mountain Fuel Supply Co.'s gas absorption plant. The plant has a capacity of 119 million cubic feet of gas per day. The field serves the Utah metropolitan area.

ARTIFICIAL ICE PLANT—Pacific Fruit Express Company plans a million dollar artificial ice plant at its Laramie facilities. Pacific Fruit is jointly owned by Union Pacific and Southern Pacific Railroads. Laramie facilities house one of the world's largest double-deck railroad icing platforms. New project includes the installation of refrigeration equipment in existing ice storage houses, the erection of a one-story building to house ice manufacturing equipment and newly-designed ice delivery facilities for moving ice from storage rooms to the icing platform.

Safety Engineers Should Use Psychology

"KNOW MORE about people," is the suggestion of Elmo E. Chappell, safety engineer for Chevrolet-Oakland division of General Motors, Oakland, Calif., in his speech before the National Safety Council. Chappell's discussion of the problem of "Maintaining Interest in Accident Prevention" stresses the necessity of establishing standards for those who enter the safety engineering field.

He feels that too many safety engineers are not interested in their jobs and have no professional stature.

Chappell lists the psychological appeals which may be made to people, which are: instinct of self-preservation; desire for material gain; desire for praise or distinction; fear of ridicule or disapproval; sense of humanity; sense of responsibility; sense of loyalty; competitive instinct, and desire for power or leadership.

Authority for the safety engineer, use of suggestions by employees, and a good publicity program may boost and maintain safety interest. "The safety engineer is the foundation, and to do his job he must be sincere, enthusiastic, of pleasant disposition, and able to get along with people."

GEARS

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- For every industry
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More Efficient Than an Elevator . . .
Cost $3,044 LESS!

WRITE— for Suggestion. Give height, floor to floor and horizontal space available— Also maximum unit load.

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WESTERNERS AT WORK

California

GLEN T. JOHNSON is the new general manager of the *Dodge* San Leandro, Calif., plant. He succeeds JOHN P. MANSFIELD, recently appointed vice president of Plymouth Motor Corporation. Johnson, who has been with *Chrysler Corporation* for the past 18 years, was formerly general superintendent in San Leandro.

Johnson

Sisley

Pacific Airmotive Corporation's manufacturing division announces four new appointments. GEORGE B. SISLEY takes over as production manager. BOYD DAHLE becomes chief design engineer; R. M. FRANCIS is chief project engineer; L. W. REITHMAIER is chief research engineer and B. C. GAY is project engineer.

DONALD N. BERRY is the new chief mechanical engineer for *Hoffman Radio Corp.*, Los Angeles.

New executive vice president of *Pacific Public Service Company* is J. K. HORTON. A. R. BAILEY is elected a vice president of the company. Both men have been associated with the firm's subsidiary, *Coast Counties Gas and Eletcric Company* since 1948.

HARRY F. WILLIAMS, former paymaster for *Hoffman Radio Corp.*, Los Angeles, is now chief accountant and secretary of the board, *Gertsch Products, Inc.*, Los Angeles, electronic manufacturers. THOMAS P. WALKER is new vice president and R. A. YARCHO is treasurer.

Consolidated Vultee Aircraft Corp.'s supersonic guided missile division has HARRY F. CROSS as production manager; HOWARD HART as manager of inspection; industrial relations manager, HARLAN FILLOON; MARION HIGDON, master scheduling administrator and JAMES P. SYREN, manager of contracts.

HAROLD C. MCCLELLAN, president and founder of *Old Colony Paint & Chemical Co.*, Los Angeles, adds position of president of the Board of Trustees of Occidental College to his many other activities.

The post of personnel manager of *National Motor Bearing Co., Inc.*, goes to PAUL RICHMOND, formerly associated with the Pasadena Star News. Richmond holds a bachelor's degree in industrial relations from the University of Southern California.

BRIG. GEN. JOSEPH A. HOLLY, USA, retired, appointed executive assistant to the management of *Food Machinery Corporation's* newly established ordnance division, San Jose. GEORGE T. CUNNINGHAM becomes purchasing agent for packing equipment division of FMC. He succeeds LEO D. HARRIS, resigned.

H. N. MAY is now chief of material for *Consolidated Vultee Aircraft Corporation's* San Diego division. Formerly purchasing agent for the division, he will now have charge of both sub-contracting and purchasing. J. C. BUCHAN, buying supervisor, succeeds May as division purchasing agent.

H. J. VAN DER LINDE goes up from airplane production superintendent to production manager of *Ryan Aeronautical Co.*, San Diego.

New manager of *Swift & Co.'s* South San Francisco plant is E. D. FLETCHALL, former assistant manager at South St. Paul. He succeeds F. E. BORCHERS, who will manage the Omaha, Neb., plant.

ELMER HALL takes over duties of general manager of *Mutual Plywood Corp.* He previously worked for *M & M Wood Working Co.*, Eureka.

HOWARD K. SUTER is now plant manager of *Rosán, Inc.*, South Gate. Suter will be in full charge of Rosán manufacturing facilities and will be responsible for developing new methods and expediting the flow of orders through the plant.

W. S. TOWNE is the new president of *Pioneer Rubber Mills*. He succeeds HAROLD R. MANSFIELD, who retires after 46 years of service to the company.

HOWARD G. SMITH returns to *Resin Industries*, Santa Barbara, as vice president. He first joined Resin in 1946 and shortly became sales manager, but he left the firm in 1948 to accept an important assignment with *American Radiator & Standard Sanitary Corp.*

Colorado

Several personnel changes are taking place at Pueblo plant of *Colorado Fuel and Iron Corporation*. RUDOLPH SMITH becomes works manager. He has been with company since 1927 in several engineering positions. Smith succeeds J. J. MARTIN, elected vice president in charge of operations. GEORGE GROSVENOR, Smith's former assistant, gets promoted to superintendent of the open hearth. IVER T. ELLINGBOE serves as Grosvenor's assistant. HAROLD GUMMA becomes assistant superintendent of rolling mills, working under superintendent VICTOR JOHNSON.

Smith

King and Kringle Machinery Corp., Denver, appoints J. M. EAST vice president and general manager.

Denver and Rio Grande Western Railroad names T. M. DAVIS, Denver, to head its Rio Grande Motorway subsidiary. The new president will continue to act as general manager.

Jones and Nylene Mining Company, Pueblo, now have the services of FRANK E. SIEGFREID, formerly the shift boss for the *Telluride Mines, Inc.*

Oregon

Iron Fireman Manufacturing Company gives promotions to: LEWIS J. COX, Portland, who becomes vice president in charge

Cox

Jennings

Hecox

of public and employee relations; JACK L. JENNINGS, Portland, vice president in charge of operations, and FRANK S. HECOX will continue as vice president and treasurer.

Western Pine Association, Portland, selects ARTHUR T. UPSON, veteran forester and lumberman, as district forest engineer for Arizona, New Mexico, Colorado and Wyoming.

HOWARD B. GARRISON is now managing the West Coast Wood Products division of the *Evans Products Co.*

Utah

JOHN H. CONE serves as engineer for *Combined Metals Reduction Company's* Panacalite division, Salt Lake City.

Resident manager of U. S. Atomic Energy Commission's Monticello plant is A. C. EVSIGN.

Washington

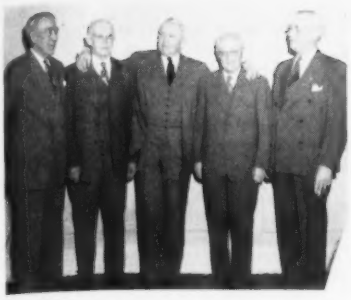
Washington State Institute of Technology, division of research, adds DR. GEORGE G. MARRA to the staff. He replaces DR. EARL G. HALLONQUIST, who resigns to enter private industry.

CLARENCE H. CARLANDER, president of *Puget Sound Freight Lines*, is now secretary of the Port of Seattle Commission, replacing the late J. A. EARLEY.

THOMAS CORNILS is chief engineer for the Pacific Northwestern Division of *Link Belt Company*, with headquarters in Seattle. Cornils joined the company in about 1928 shortly after his graduation from University of Washington in mechanical engineering.

Cornils

Fifty years of service to *The Long-Bell Lumber Company* brought service awards to L. L. CHIPMAN and GEORGE S. HAYS. Chipman is a company director and Hays is general manager of Vaughn division, near Eu-



Proudly wearing 50-year service pins awarded by The Long-Bell Lumber Co. (see accompanying item). Left to right: *S. M. Morris, G. Hays, J. M. White, L. L. Chipman* and *J. H. Kenesson.*

gene, Ore. S. M. MORRIS and J. H. KENESSON, other fifty year men were present to watch President J. M. WHITE issue the 50-year pins.

ASSOCIATIONS ELECT

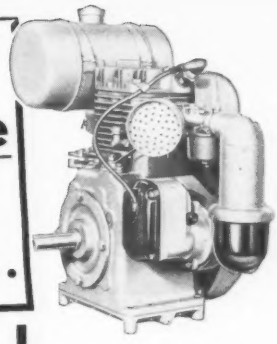
Electrical Maintenance Engineers Assn. of So. Calif.: (left to right above) *Henry R. Bente,* Albert C. Martin & Associates, secretary-treasurer; *Harold S. Davis; George Larsen,* Larsen-Hogue Electric Co., 1st vice-president; *Richard Rogers,* Ace Day & Night Electric Co., 2nd vice-president, and *Frank J. Robring,* Southern California Edison Co., president.

Mining Association of Montana: President, L. B. MANNING, manager, Trout Mining Division, American Machine & Metals, Inc., Phillipsburg; vice presidents, TED COLLINS, Collins Land Company; LYMAN H. BROOKS, JR., president and manager, Irma Mines, Inc.; secretary-treasurer, CARL J. TRAUERMAN, president, Butte Copper Consolidated Mines.

Furniture Manufacturers Assn. of So. Calif.: (left to right above) *Herman Kranz,* Morris of California, president; *Percy Solotoy,* Brown-Saltman of California, vice-president; *Joseph Siskin,* Angelus Furniture Mfg. Co., treasurer, and *Edward S. Feldman,* executive secretary.

Canners League of California: President, JOHN A. OWEN, vice president, Pratt-Low Preserving Company; vice presidents, GEORGE E. MCDEARMID, Libby, McNeill & Libby, R. G. LUCKS, California Packing Corporation.

Gain More Power Advantage for Your 3 to 6 hp. Units...



Presented here are a few of the basic facts why Wisconsin Heavy-Duty Air-Cooled Engines offer important advantages to the designing engineer, equipment manufacturer and the ultimate user:

1. Rotary type high tension magneto, with impulse coupling, mounted on outside of engine . . . operates as an entirely independent unit that can be serviced or replaced in a few minutes.

2. Self-cleaning tapered roller bearings at both ends of the crankshaft . . . will withstand side-pull or end-thrust without danger to bearings.

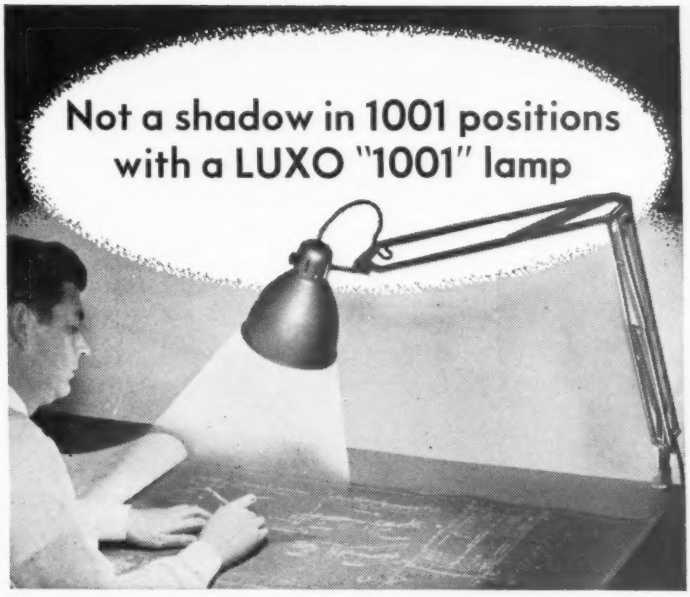
3. Maximum torque at usable speeds . . . most desirable on equipment that really has to go to work.

Our Engineering Department will be glad to co-operate with you in adapting Wisconsin Engines to your requirements. Write for detailed data.

Condensed Specifications
4-Cycle Single Cylinder

Engines	Model ABN	Model AKN
Bore	2½"	2⅞"
Stroke	2¾"	2¾"
Piston Displ. (Cu. In.)	13.5	17.8
HORSEPOWER		
1800 R.P.M.	2.5	3.6
2200 R.P.M.	3.1	4.5
2600 R.P.M.	3.7	5.3
3000 R.P.M.	4.2	5.9
3600 R.P.M.	4.6	6.2
No. of Piston Rings		4
Fuel Tank Cap.		1 Gal.
Weight, lbs.		Net Crated
Standard Engine	76	89

WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 46, WISCONSIN



HERE is a practical working lamp with finger-tip flexibility . . . a mere "flick" and it *stays put* at any desired angle. The LUXO "1001" is concentrated light that instantly kills shadows and glare by means of its flexibility. Candle power is increased or decreased by elevation. The LUXO "1001" lamp is easily attached . . . portable or stationary. Covers an entire circle with an area of 35 square feet. Available in 6 harmonious colors. Come in and see it demonstrated, or write for folders.

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Western TRADE WINDS

News about those who distribute and sell industrial equipment and materials

Materials Handling Equipment Company, 1437 Elliott Ave., Seattle, Wash., is Northwestern representative for *Metzgar Company*, Grand Rapids, Mich.

General Electric Company's North Pacific Sales District now has C. A. Rost as manager. He replaces the late Walter J. Pitblado.

Burke

Hansen Manufacturing Company of Cleveland appoints *The Burke Company*, 1246 Bush St., San Francisco, Calif. district representative in Northern California area. The firm will distribute Hansen Quick-Connective Couplings used in pneumatic and hydraulic service.

The post of assistant director at *Pittsburgh Plate Glass Company's* paint division, Los Angeles, Calif., goes to W. Harold Douglas. He has been with the firm since 1918 and on the West Coast during the last nine years. His offices will be at the company plant in Torrance. Murray A. Bradley, named industrial sales manager of the company, will also headquarter at Torrance.

Douglas

Bradley

E. V. Roberts and Associates, Los Angeles, Calif., engineering representatives, are moving to a new building at 5066 W. Washington Blvd., with over 2,000 sq. ft. of floor area for offices and warehousing. Field engineers Don Hagen and Frank Lebell will also work out of the new headquarters.

Northern California district sales manager for *Kaiser Steel Corp.*, Oakland, N. H. Balaam, transfers to Washington to manage the firm's newly opened offices there. C. F. Cooper will be acting district sales manager, in Northern California.

Tay-Holbrook Co. of San Francisco, Calif., is now a stocking jobber by the *C. A. Dunham Co.*, heating system manufacturer. The company will handle the distribution of Dunham products in the Northern California area. Branch offices are in major northern cities in the state.

The Dolph Co. of New Jersey appoints the *Tri-State Supply Corp.* of San Francisco and Los Angeles as distributor for their insulating varnish products.

Don Hall takes charge of sales for Strata-Crete and Strata-Seal, *Great Lakes Carbon Corporation* products, in the California, San Juan Basin, Nevada and Utah areas. As division sales manager he will maintain headquarters at the main offices of the Strata-Crete division, Long Beach, Calif.

C. D. Sutton, Inc., is now the Los Angeles, Calif., area representative for the *Eriez Manufacturing Company*, Erie, Pa. The firm will handle the complete company line, which includes magnetic separation equipment. Research and laboratory facilities on both permanent and electromagnetic equipment will be made available through the Sutton Co.

Fred F. Welch becomes the new manager of the *Hyster Company's* retail store in Seattle, Washington. He joined Hyster in 1948 and has been one of the division's leading salesmen in several Washington and Oregon counties.

Eric O. Melmer becomes secretary and chief engineer of *Jervis B. Webb Company of California*, Los Angeles. Melmer has been in the conveyor business for over 20 years and has invented many devices to serve the materials handling industry.

Sales and warehousing operations of the *B. F. Goodrich Company's* Denver, Colo., district are being expanded with the official opening of facilities at a new location in the city. The move is intended to consolidate operations and speed up customer service through larger and more efficient warehousing.

New district representative for the *Frank G. Hough Co.* is Marshall O. Nystrom, who will work with distributors in the Southwest. He will have offices in Los Angeles.

Nystrom

Harold R. Swanton, Inc., 1706 So. Grand Ave., Los Angeles, with offices also in San Francisco and Seattle, and engineers serving Hawaii and Alaska in addition to the Western States, becomes exclusive sales representative in the 11 Western States, for products of *Albert Trostel & Sons Co.*, Packings division, Milwaukee, Wis. Products include Trostel's complete line of oil seals, "O" rings, leather "V" packings,

MAGCOA LIGHTWEIGHT MAGNESIUM

RAMP-DOCKBOARDS

...are flexible for greater freight-loading efficiency

Ramp and Dockboard lock together with simple pin device
Hand holds in each corner for safe, easy handling
Special quarter round curbs prevent runoffs—offer maximum clearance for equipment
Beveled edges minimize jarring of load
Rounded curb ends allow greater turning radius

A combination of two sections—the ramp (with I-beam legs), and the Dockboard. Each lightweight magnesium unit can be handled safely and easily by one person. Dockboard is used as separate unit when height difference is less than fixed height of ramp. When greater height differences are encountered, the ramp and Dockboard combination is used.

Specially designed for applications where low-clearance loading equipment is used. Weighs only ¼ as much as steel ramps of equal size and strength. A modern answer to materials handling headaches in all industrial and commercial fields. Write for complete details today!

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Magnesium DOCKBOARD

MAGNESIUM COMPANY OF AMERICA

leather cup packings, leather back-up washers, and synthetic "V" packings. This new line ties in closely with Swanton's normal operation, direct factory representation for ball and roller bearings.

Montague-Harris & Co., 3509 E. Olympic Blvd., Los Angeles, is Southern California representative for *Kling Bros. Engineering Works of Chicago*. Montague-Harris has represented the company in Northern California for the past several years. The Kling line will now be given state-wide coverage.

Guy L. Warden & Sons, formerly district representative for the *Johnson Corporation*, Three Rivers, Mich., in lower California, will now cover the entire state, as well as Curry, Josephine and Jackson counties in Oregon. Offices are now set up in Oakland, as well as Los Angeles, Calif., to handle the increased territory.

Stoudt

OSBORN J. STOUDT appointed sales manager for Los Angeles division of *Brumley-Donaldson Company*. He has been in the foundry business since 1935.

JOHN R. FENNIE appointed manager of the Tubular Products department of *Joseph T. Ryerson & Son, Inc.*, Los Angeles, Calif. steel distributors. Fennie joined the firm's sales staff at Los Angeles in 1946. He will head the department responsible for merchandising tubular products.

C. P. LINGLE now heads up the Denver sales branch of *Celotex Corporation*, Chicago, Ill. Lingle was formerly sales representative in Seattle, Wash., area. E. P. LARSON, formerly in Denver is being transferred. Denver office takes over the portions of Washington, Oregon, Idaho and Montana formerly served by the company's Los Angeles, Calif., branch.

Additions to *Minneapolis-Honeywell Regulator Company's* Western field staff include: MERLE O. EVERS, San Francisco office; FRANK J. STEVENS, Los Angeles, and ROBERT R. STALNAKER to the Denver office. RALPH BROGIE reassigned to San Francisco.

New Pacific Coast district sales manager of American Chain and Manley divisions of *American Chain & Cable Co.* is FREDERIC L. ROWE. He has been with the company since 1927 and in recent years represented the Pacific Northwest division.

W. D. EVAN, JR., *Pacific Industries*, 1046 S. Olive St., Los Angeles, Calif., is new sales representative for *Marcus Transformer Co.*, Hillside, N. J. Evan succeeds *Robert Young & Co.*

Frank L. Robinson Co., Latham Square Bldg., Oakland, Calif., is now sales representative for materials handling equipment manufactured by *Silent Hoist & Crane Co., Inc.*, Brooklyn, N. Y.

Rapids-Standard Co., Inc., of California opens new offices in Los Angeles at 923 E. 3rd St., with LLOYD G. BACKART as acting branch manager. JACK GOLDMAN is now service engineer for Rapids-Standard, according to C. PLIN MEARS, general manager. Goldman comes from the factory where he has been in the engineering department for many years. Goldman will be in charge of the company engineering staff for California with headquarters at 444 Brannan St., San Francisco.

Several sales and service branches of *Fruehauf Trailer Company* in the West get new managers. WALTER R. PAVELA takes over at the Sacramento, Calif., branch as successor to A. K. TICE, now assistant to the vice-

Pavela *Quinn* *Porter*

Crayton *Holm* *Kirksey*

president in charge of sales in Detroit. WALTER P. QUINN starts in Salt Lake City, Utah, where Pavela left off. Phoenix, Ariz., branch gets L. G. CRAYTON to replace A. V. TICE, now division sales manager at Los Angeles, Calif. AMOS H. KIRKSEY takes over at Oakland, Calif., S. K. PORTER at Los Angeles and MARVIN G. HOLM in Spokane, Wash.

J. E. VOSBURGH is new Western district sales manager in charge of the eleven Western states for *Miller Electric Manufacturing Company*, Appleton, Wis.

Reliance Gauge Column Company, Cleveland, Ohio, appoints CHARLES P. CROWLEY, 711 Gibbons Street, Los Angeles, sales engineer in the Southern California area. Reliance manufactures steam boiler safety devices.

Hunt Foods, Inc., selects JOHN D. VELLIS, vice president, to head its recently created trade relations department. Purpose of the new department is to serve as a link between the company and the large group of food processors, distributors and suppliers, industrial groups and government agencies concerned in the firm's business. The Hayward, Calif., plant will house Vellis' headquarters.

Electro Engineering Products Co., Inc., Chicago, Ill., appoints *Marshank Sales Co.*, Los Angeles, to represent the company in California, Arizona and Nevada.

National Coil Co., Sheridan, Wyo., makers of ID and RF coils, appoints HAROLD A. KITTLESON, Los Angeles, as its California representative.

Westinghouse Electric Corp. names FRANK BODINE of San Francisco, Calif. to a new post as manager of the central station division for the Pacific Coast district. He takes charge of the sale of electrical apparatus to electric utility organizations throughout the district, comprising nine Western states, Alaska and Hawaii. He succeeds W. P. L'HOMMEDIEU, who is promoted to assistant district manager.

Bodine

JAMES H. BURSON joins the San Francisco, Calif., headquarters of the *Westinghouse Electric Corp.* as a lighting specialist. He will take charge of the sale of company street, highway and aviation lighting equipment in Northern and Central California and Western Nevada.

A. R. BOOKER, who for the past 18 months has been under contract to the *Electrofilm Corp.* as vice president and sales director, returns to *Booker-Cooper, Inc.*, Los Angeles, Calif., advertising agency of which he is the president.

Heller Brothers Company, Newcomerstown, Ohio, is making several changes in its sales territories. LESTER P. EVANS, Los Angeles, Calif. territory, adds New Mexico, Arizona and El Paso, Tex. In addition to the San Francisco, Calif. area, DONALD B.

Maas

the finest phosphates

ARMOFOS
Sodium Tripolyphosphate

TRISODIUM PHOSPHATE

DRI-TRI
Trisodium Phosphate Anhydrous

SODIUM ACID PYROPHOSPHATE

TETRASODIUM PYROPHOSPHATE
Anhydrous & Crystal

DISODIUM PHOSPHATE

PHOSPHORIC ACID
75% Food Grade – 85% N. F.

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Located in San Francisco Bay Area at Benicia

For contract manufacturing and for sub-contracting parts and assemblies, use YUBA and save time, expense, and personnel worries. Our varied plant facilities enable us to handle almost any metal product—light or heavy. We have skilled workers and a long-time reputation for stable labor relations, plus years of experience in contract manufacturing and fabricating for private industry and government.

Services Available to You Include—

- ✓ Carbon and alloy steel forging
- ✓ Heat treating
- ✓ Steel fabricating and welding
- ✓ Pattern shop
- ✓ Iron and bronze foundry
- ✓ Heavy and light machining
- ✓ Export packaging

These services are especially adaptable to manufacturers wishing to sub-contract defense orders.

HANDY SETUP... FACTORY AT BENICIA OFFICES IN S. F.

YUBA's plant is located at Benicia., Calif., handy to deep water, transcontinental railroad, truck and air shipping. General offices and engineering department are situated in San Francisco's financial district.

Send us your drawings and specifications for estimates. No obligation. Write, wire or telephone EXbrook 2-0274.

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WILSON takes on Colorado, Utah and Nevada. Los Angeles area service engineer, WILLIAM J. HOPKINS is promoted to salesman for Washington, Oregon, Montana, Idaho, and Wyoming. EDGIL C. FISHER will replace Hopkins.

WILLIAM LAUGHLIN takes over as acting sales manager for *Pacific Airmotive Corp.'s* branches in Oakland, Seattle and Kansas City as well as company headquarters in Burbank, Calif. He steps up from PAC's sales staff.

Marshall & Peron Company, Los Angeles, Calif., are the new Southern California distributors for the *National Engineering & Manufacturing Company*, Kansas City, Mo. The firm will distribute National's air-flow portable dryers.

Swart

EVERETT L. SWART is new branch manager of the Seattle, Wash., office of *Independent Pneumatic Tool Co.*, Aurora, Ill. Swart comes from Minneapolis. L. OLSON continues as office manager at Seattle.

BERNARD WEIGEL joins the sales department of *Tri-Valley Packing Association*. He joined Tri-Valley about four years ago, and his primary job has been coordinating the work between sales, traffic, stock and billing.

The new Northwest representative for the *Martin Brothers Box Company*, Whittier, Calif., is DAN LOWN. Lown, who has about 10 years experience in volume shipping operations, will have offices in Seattle, Wash.

West Coast Chemicals and Solvents Corp. appoints *Griffin Chemical Company*, San Francisco, Calif., as exclusive Northern California sales representatives for all products manufactured by their subsidiary, *Lac Chemicals, Inc.*, Culver City, Calif.

Stevens

Dillon Stevens & Company, 144 N. Larchmont Blvd., Los Angeles, Calif., is the new sales representative on the West Coast for all products of *Bingham-Herbrand Corporation*, Toledo, O., and *Billings & Spencer Company*, Hartford, Conn. Dillon Stevens will handle custom forging and stamping contracts and the sale of mechanics' hand tools for the well known Herbrand and Billings lines.

Mailler Searles, Inc., of 300 Seventh St., San Francisco, with branch offices at 4501 S. Santa Fe Ave., Los Angeles and 3222 Western Ave., Seattle, announce voluntary discontinuance of a number of their former lines of representation, in order to be able to concentrate efforts on sales and service for the following lines which will be kept: Hartford Empire Company, Glass Machinery Division; Standard-Knapp Division of Hartford Empire Company; Plax Corporation, wholly owned Hartford Empire subsidiary; Ace Specialty Manufacturing Company, Los Angeles; Alvey Conveyor Manu-

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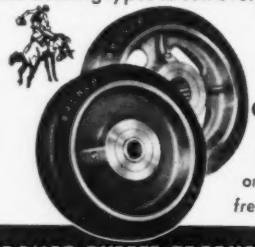

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facturing Company, St. Louis; Hayssen Manufacturing Company, Sheboygan, Wis.

Accounts terminated as of January 31, 1951, are Durant Manufacturing Company, and Logemann Bros. Company, both of Milwaukee; Karl Kiefer Machine Company, Cincinnati; Niagara Packaging Machinery Company, Buffalo; Roto Bag Machine Corp. and Tite-Cap Machine Co., both of New York; Transparent Wrap Machine Corp., Hasbrouck Heights, N. J.; U. S. Automatic Box Machinery Co., Inc., Boston.

At San Francisco these accounts will be handled by *James C. Hale and Company*, 300 Seventh St., headed by JAMES C. HALE, formerly with Mailler Searles, Inc. In the Northwestern states, the representative will be PAUL J. SHORT, 4439 N. E. Killingsworth, Portland. In Utah, western Colorado, western Wyoming and southeastern Idaho, *The Horsley Company*, 401 Kiesel Bldg., Ogden, will have the line and also will continue to represent Mailler Searles in the area in the application of Standard Knapp equipment. For Southern California, Arizona and southern Nevada, arrangements were still in process at the time of going to press.

Garlinghouse Brothers, Los Angeles, Calif. construction equipment distributors, announce plans for construction of a $60,000 structure to house offices, salesroom, and warehouse facilities.

Lineweaver

Sales promotion director is the title of HUGH M. LINEWEAVER, who is joining *Forest Fiber Products Company*, Forest Grove, Ore. He will coordinate sales promotion activities.

GEORGE C. LICHTY, materials handling engineer, joins the *Buda Engine and Equipment Co., Inc.*, Portland, Ore., as district manager of the Northwestern territory. His offices will be in Portland.

Consolidation of the sales and service facilities of the *National Supply Company's* engine division with those of the *Atlas Imperial Diesel Engine Company* is now complete. J. A. FLYNN manages the Terminal Island, Calif., branch which has machine shop, sales and service facilities.

G. S. Marshall Co., engineering representatives, move to new and larger quarters in Pasadena, Calif. They take over representation for microwave division of *The Calnevar Co.*, Los Angeles, Calif., in California, Arizona, and New Mexico.

Armco Drainage & Metal Products, Inc., names JERRY B. DEAN as their new Montana State manager, succeeding the late H. W. GREGORY of Missoula. Dean, who has been with the company for twenty years, will set up offices in Billings, and the Missoula office will be closed.

The title of coordinator of defense activities for plastics at *The Dow Chemical Company* goes to DEANE R. EBEY, former supervisor of plastic sales, Los Angeles, Calif. He transfers to the home plant and office at Midland, Mich. ROBERT L. CURTIS succeeds Ebey.

VANCE L. PETERS, San Francisco, Calif., is the new district representative for the *Standard Electrical Tool Company*, Cincinnati, Ohio. Northern California, Oregon and Washington are included in his territory.

OSCAR DE LEON PEREZ joins the export division of *Hunt Foods, Inc.*, at the company's general offices in Fullerton, Calif. He will handle dealings of the firm with Latin American countries.

N. W. JONES, Portland, Ore., is one of *Electric Storage Battery Company's* executives who spoke at the firm's four-day conference in Kansas City, Mo. The conference was held to exchange ideas on new production methods and plant management problems.

JOE HART becomes the new manager of the Metal Processing Sales division of *Turco Products, Inc.*, Los Angeles. He will

Buist *Miller* *Hart*

act as special sales representative and technical advisor to the metal processing and general manufacturing fields. LOU H. MOULTON, vice president and national sales director, retires from the company, succeeded by DAN T. BUIST. DAN T. MILLER fills the new position of Coordinator of Sales.

Arcos Corporation, welding electrodes manufacturer, opens a West Coast office and warehouse in Los Angeles. B. E. DAVID is district manager for the office at 427 South Western Ave.

Western Industrial Supply Company, 905 G St., Sacramento, Calif., is a new dealer for *Allis-Chalmers* motors and controls in the following California counties: Butte, Colusa, Eldorado, Glenn, Lassen, Nevada, Placer, Plumas, Sacramento, Sierra, Sutter, Yolo and Yuba.

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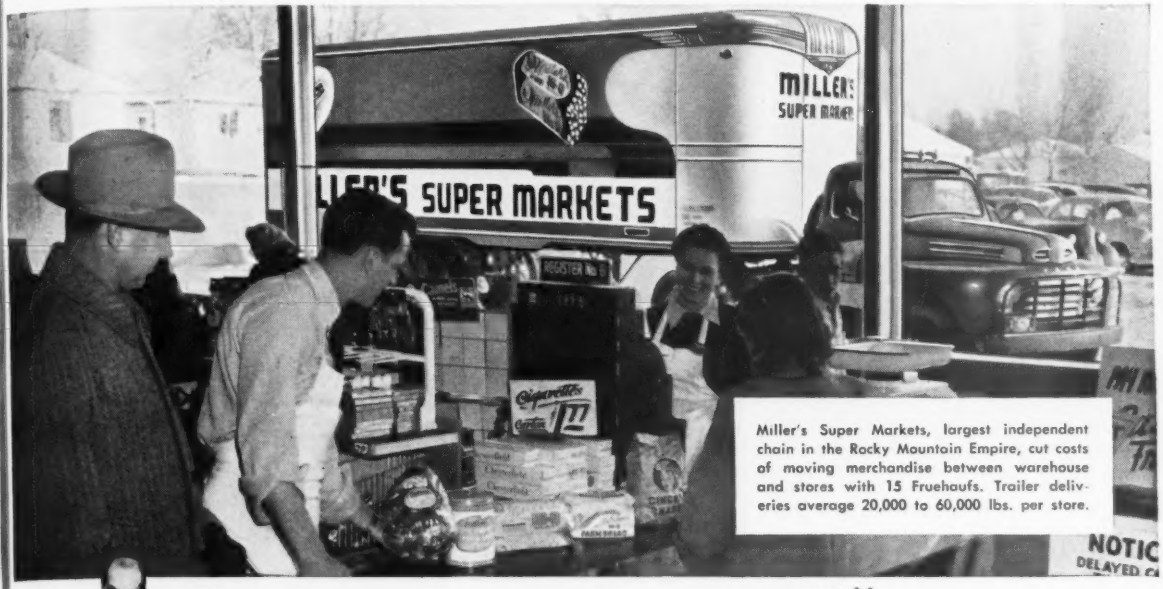

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Paul Cohen, Supt. of Warehousing & Transportation, Miller's Super Markets

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Bulk Storage and Shiploading plant at Hilo, Hawaii

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